

2-117
PUBLICATIONS OF THE UNIVERSITY OF PENNSYLVANIA

SERIES IN

Philology Literature and Archæology

VOL. III, No. 2

A PRIMER OF
MAYAN HIEROGLYPHICS

BY

DANIEL G. BRINTON, A.M., M.D., LL.D., Sc.D.

PROFESSOR OF AMERICAN ARCHÆOLOGY AND LINGUISTICS IN THE UNIVERSITY OF PENNSYLVANIA,
PRESIDENT OF THE AMERICAN ASSOCIATION FOR THE ADVANCE-
MENT OF SCIENCE, ETC., ETC.

"Hieroglyphics old,
Which sages and keen-eyed astrologers
Then living on the earth, with labouring thought,
Won from the gaze of many centuries."

— KEATS

GINN & COMPANY

Agents for United States, Canada, and England
7-13 Tremont Place, Boston, U.S.A.

MAX NIEMEYER

Agent for the Continent of Europe
Halle, a S., Germany.

U. Lxxviii.

19 / 6

PQL.781 (2)



22101986687

STORY
OF
MOM
AND
DAD

79957

PUBLICATIONS OF THE UNIVERSITY OF PENNSYLVANIA

SERIES IN

Philology Literature and Archæology

VOL. III No. 2

A PRIMER OF
MAYAN HIEROGLYPHICS

BY

DANIEL G. BRINTON, A.M., M.D., LL.D., Sc.D.

PROFESSOR OF AMERICAN ARCHÆOLOGY AND LINGUISTICS IN THE UNIVERSITY OF PENNSYLVANIA,
PRESIDENT OF THE AMERICAN ASSOCIATION FOR THE ADVANCE-
MENT OF SCIENCE, ETC., ETC.

“Hieroglyphics old,
Which sages and keen-eyed astrologers,
Then living on the earth, with labouring thought,
Won from the gaze of many centuries.”

—KEATS

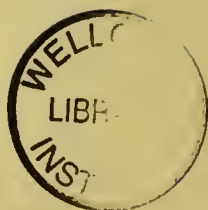
GINN & COMPANY

Agents for United States, Canada, and England
7-13 Tremont Place, Boston, U.S.A.

MAX NIEMEYER

Agent for the Continent of Europe
Halle, a S., Germany

[1895]



PQL. 781 (2)

PREFACE.

In the following pages I have endeavored with the greatest brevity to supply the learner with the elements necessary for a study of the native hieroglyphic writing of Central America. The material is already so ample that in many directions I have been obliged to refer to it, rather than to summarize it. This will explain various omissions which may be noted by advanced scholars; but they will not, I believe, diminish the usefulness of the work as an elementary treatise.

In conclusion I would express my thanks to the officers of the Bureau of American Ethnology, Washington, and of the Peabody Museum of Archæology, Cambridge, for various facilities they have obligingly furnished me.

CONTENTS.

I. Introductory.

	PAGE
1. GENERAL CHARACTER OF MAYAN HIEROGLYPHICS,	9
2. THE MAYAN MANUSCRIPTS OR "CODICES,"	11
3. THEORIES OF INTERPRETATION. "ALPHABETS" AND "KEYS,"	13

II. The Mathematical Elements.

1. THE CODICES AS TIME-COUNTS,	18
2. THE MAYAN NUMERAL SYSTEM,	19
3. NUMERICAL AND ALLIED SIGNS,	19
4. THE RHETORICAL AND SYMBOLIC USE OF NUMBERS,	24
5. THE MAYAN METHODS OF COUNTING TIME,	25
6. THE CALCULATIONS IN THE CODICES,	29
7. RULES FOR TRACING THE TONALAMATL, OR RITUAL CALENDAR,	31
8. THE CODICES AS ASTRONOMICAL TREATISES,	32
9. ASTRONOMICAL KNOWLEDGE OF THE ANCIENT MAYAS,	34

III. The Pictorial Elements.

1. THE RELIGION OF THE ANCIENT MAYAS,	37
Itzamna—Cuculcan—Kin ich—Other Gods—The Cardinal Points— The Good Gods—The Gods of Evil—The Conflict of the Gods.	
2. THE COSMOGONY OF THE MAYAS,	46
3. THE COSMICAL CONCEPTIONS OF THE MAYAS,	47
4. PICTORIAL REPRESENTATIONS OF DIVINITIES,	50
Representations of Itzamna—Of Cuculcan—Of Kin ich—Of Xaman Ek, the Pole Star—Of the Planet Venus—Of Ghanan, God of Growth—Of the Serpent Goddess—Of Xmucane—Of Ah puch, God of Death—Of the God of War—Of Ek-Ahau and other Black Gods.	
5. THE MAYA PRIESTHOOD,	68
6. FANCIFUL ANALOGIES,	69
7. TOTAL NUMBER OF REPRESENTATIONS,	70
8. FIGURES OF QUADRUPEDES,	71
9. FIGURES OF BIRDS,	72
10. FIGURES OF REPTILES,	74
11. OCCUPATIONS AND CEREMONIES,	76

IV. The Graphic Elements.

	PAGE
1. THE DIRECTION IN WHICH THE GLYPHS ARE TO BE READ,	78
2. COMPOSITION OF THE GLYPHS,	81
3. THE PROPER METHOD OF STUDYING GLYPHS,	81
4. AN ANALYSIS OF VARIOUS GRAPHIC ELEMENTS,	82
<p>The Hand—The Eye and Similar Figures—The "Spectacles"—The Ear—Crescentic Signs—Sun and Moon Signs—Supposed Variations of the Sun Sign—The Knife Signs—The "Fish and Oyster" Sign—The Sacred Food Offerings—The <i>Ben ik</i> and Other Signs—The Drum Signs—The Yax and Other Feather Signs—The Cross-hatched Signs—Some Linear Signs and Dots—Linear Prefixes—The "Cloud-balls" and the "Corkscrew Curl"—Signs for Union—The "Tree of Life"—The "Machete" and Similar Signs—Supposed Bird Signs—The "Crotalean Curve"—Objects Held in the Hand—The Aspersorium, the Atlatl and the Mimosa—The "Constellation Band"—The Signs for the Cardinal Points—The Directive Signs—The "Cuceb."</p>	
5. THE HIEROGLYPHS OF THE DAYS,	109
6. THE HIEROGLYPHS OF THE MONTHS,	116
7. THE HIEROGLYPHS OF THE DEITIES,	121

V. Specimens of Texts.

1. THE GOD OF TIME BRINGS IN THE DEAD YEAR. DRESDEN CODEX, . .	127
2. SACRIFICE AT THE CLOSE OF A YEAR. DRESDEN CODEX,	128
3. END OF ONE AND BEGINNING OF ANOTHER TIME PERIOD. CORTESIAN CODEX,	129
4. THE GOD OF GROWTH AND THE GOD OF DEATH. CORTESIAN CODEX, .	131
5. AUGURIES FROM THE NORTH STAR. CORTESIAN CODEX,	131
6. ITZAMNA, THE SERPENT GODDESS, AND KIN ICH. DRESDEN CODEX, . .	132
7. THE GODS OF DEATH, OF THE SUN, AND OF WAR. DRESDEN CODEX, .	132
8. CUCULCAN MAKES NEW FIRE. CODEX TROANO,	133
9. THE GODS OF DEATH, OF GROWTH, AND OF THE NORTH STAR. DRESDEN CODEX,	133
10. THE GOD OF GROWTH, OF THE SUN, AND OF THE EAST. DRESDEN CODEX,	134
11. AN INSCRIPTION FROM KABAH,	135
12. LINEAR INSCRIPTION FROM YUCATAN,	136
13. THE "INITIAL SERIES" FROM THE TABLET OF THE CROSS, PALENQUE, .	137
14. INSCRIPTION ON THE "TAPIR TABLET," CHIAPAS,	138
15. INSCRIPTION ON A TABLET FROM TONINA, CHIAPAS,	139
16. INSCRIPTION ON AN AMULET FROM OCOCINGO, CHIAPAS,	139
17. INSCRIPTION ON A VASE FROM A QUICHE TOMB, GUATEMALA,	140

A PRIMER OF MAYAN HIEROGLYPHICS.

I. Introductory.

The explorations among the ruined cities of Central America undertaken of late years by various individuals and institutions in the United States and Europe, and the important collections of casts, tracings and photographs from those sites now on view in many of the great museums of the world, are sure to stimulate inquiry into the meaning of the hieroglyphs which constitute so striking a feature on these monuments.

Within the last decade decided advances have been made toward an interpretation of this curious writing; but the results of such studies are widely scattered and not readily accessible to American students. For these reasons I propose, in the present essay, to sum up briefly what seem to me to be the most solid gains in this direction; and to add from my own studies additional suggestions toward the decipherment of these unique records of aboriginal American civilization.

1. General Character of Mayan Hieroglyphs.

One and the same hieroglyphic system is found on remains from Yucatan, Tabasco, Chiapas, Guatemala, and Western Honduras; in other words, in all Central American regions occupied

at the Conquest by tribes of the Mayan linguistic stock.¹ It has not been shown to prevail among the Huastecan branch of that stock, which occupied the valley of the river Panuco, north of Vera Cruz; and, on the other hand, it has not been discovered among the remains of any tribe not of Mayan affinities. The Mexican manuscripts offer, indeed, a valuable ancillary study. They present analogies and reveal the early form of many conventionalized figures; but to take them as interpreters of Mayan graphography, as many have done, is a fatal error of method. In general character and appearance the Mayan is markedly different from the Mexican writing, presenting a much more developed style and method.

Although the graphic elements preserved in the manuscripts and on the monuments vary considerably among themselves, these divergencies are not so great but that a primitive identity of elements is demonstrable in them all. The characters engraved on stone or wood, or painted on paper or pottery, differ only as we might expect from the variation in the material or the period, and in the skill or fancy of the artist.

The simple elements of the writing are not exceedingly numerous. There seems an endless variety in the glyphs or characters; but this is because they are composite in formation, made up of a number of radicals, variously arranged; as with the twenty-six letters of our alphabet we form thousands of words of diverse significations. If we positively knew the meaning or meanings (for, like words, they often have several different meanings) of a hundred or so of these simple elements, none of the inscriptions could conceal any longer from us the general tenor of its contents.²

¹ In accordance with usage in this study, I employ the adjective "Mayan" when speaking of the whole stock, and confine "Maya," in an adjectival sense, to that branch of the stock resident in Yucatan.

² This is also the opinion of Dr. Seler: "Es ist eine verhältnissmässig geringe Zahl von Bildern und Grundelementen, die in diesen Schriftzeichen wiederkehren." *Verhand. Berliner Anthropol. Gesell.*, 1887, S. 231.

It will readily be understood that the composite characters may be indefinitely numerous. Mr. Holden found that in all the monuments portrayed in Stephen's *Travels in Central America* there are about fifteen hundred;¹ and Mr. Maudslay has informed me that according to his estimate there are in the Dresden Codex about seven hundred.

Each separate group of characters is called a "glyph," or, by the French writers, a "katun," the latter a Maya word applied to objects arranged in rows, as soldiers, letters, years, cycles, etc. As the glyphs often have rounded outlines, like the cross-section of a pebble, the Mayan script has been sometimes called "calculiform writing" (Latin, *calculus*, a pebble).

2. *The Mayan Manuscripts or "Codices."*

The hieroglyphic writing is preserved to us on two classes of remains—painted on sheets of native paper, about ten inches wide and of any desired length, which were inscribed on both sides and folded in the manner of a screen; and engraved or painted on stone, wood, pottery, or plaster.²

Of the former only four examples remain, none of them perfect. They have all been published with great care, some of them in several editions. They are usually spoken of as "codices" under the following names: the *Codex Troanus* and the *Codex Cortesianus*, probably parts of the same book, the original of which is at Madrid; the *Codex Peresianus*, which is in Paris; and the *Codex Dresdensis*, in Dresden. The two former and the two latter resemble each other more closely than they do either member of the other pair. There are reasons to believe that the two first mentioned were written in central Yucatan, and the

¹ "Studies in Central American Picture Writing," in *First An. Rep. of the Bureau of Ethnology*, p. 210.

² Among those who have especially merited the thanks of archæologists in collecting material for the study of the monuments are M. Désiré Charnay, Mr. A. P. Maudslay, Prof. F. W. Putnam; and I shall hope to add Dr. Le Plongeon, when he makes public his material.

last two in or near Tabasco.¹ This district and that of Chiapas, adjacent to it on the south, was occupied at the time of the Conquest by the Tzental-Zotzil branch of the Mayan stock, who spoke a dialect very close to the pure Maya of Yucatan; they were the descendants of the builders of the imposing cities of Palenque, Ococingo, Toniná and others, and we know that their culture, mythology, and ritual were almost identical with those of the Mayas. I shall treat of them, therefore, as practically one people.

Although Lord Kingsborough had included the Dresden Codex in his huge work on "*Mexican Antiquities*," and the *Codex Troanus* had been published with close fidelity by the French government in 1869, it cannot be said that the serious study of the Mayan hieroglyphs dates earlier than the faithful edition of the Dresden Codex, issued in 1880 under the supervision of Dr. E. W. Förstemann, librarian-in-chief of the Royal Library of Saxony.

The most important studies of the codices have been published in Germany. Besides the excellent writings of Dr. Förstemann himself, those by Dr. P. Schellhas and Dr. E. Seler, of Berlin, are of great utility and will be frequently referred to in these pages. In France, Professor Leon de Rosny, the competent editor of the *Codex Peresianus*, the Count de Charencey, and M. A. Pousse, whose early death was a severe loss to this branch of research, deserve especial mention. In England no one has paid much attention to it but Mr. Alfred P. Maudslay, whose investigations have yielded valuable results, forerunners of others of the first importance. The earlier speculations of Bollaert are wholly fanciful. In our own country, the mathematical portions of the essays of Professor Cyrus

¹ The *Peresianus* has been supposed by some to have been written in Guatemala; by others, both it and the *Dresdensis* have been considered of Tzental origin. See Pousse, in *Arch. de la Soc. Amer.*, 1885, p. 126, and Paul Perrin, "Les Annotations Européennes du Codex Peresianus," in the same, June, 1887, p. 87 sqq. Förstemann (*Entziff.* III.) gives several cogent reasons for believing that the *Dresdensis* was written in or near Palenque.

Thomas are worthy of the highest praise; and useful suggestions can be found in Charles Rau's article on the inscriptions of Palenque, and in Edward S. Holden's paper on Central American picture-writing.¹

3. *Theories of Interpretation.*

The theories which have been advanced as to the method of interpreting the Mayan hieroglyphs may be divided into those which regard them as ideographic, as phonetic, or as mixed. The German writers, Förstemann, Schellhas, and Seler, have maintained that they are mainly or wholly ideographic; the French school, headed by the Abbé Brasseur, de Rosny, and de Charencey, have regarded them as largely phonetic, in which they have been followed in the United States by Professor Cyrus Thomas, Dr. Cresson, Dr. Le Plongeon, and others.

The intermediate position, which I have defended, is that while chiefly ideographic, they are occasionally phonetic, in the same manner as are confessedly the Aztec picture-writings. In these we constantly meet with delineations of objects which are not to be understood as conveying the idea of the object itself, but merely as representing the sound of its name, either in whole or in part; just as in our familiar "rebus writing," or in the "chanting arms" of European heraldry. I have applied to this the term "ikonomatic writing," and have explained it so fully, as

¹ The four Codices can be obtained by placing an order with one of the leading importers of foreign books in New York City. The four cost about one hundred dollars. The study of the German writers is indispensable. The contributions of Dr. Schellhas and Dr. Seler will be found in the numbers of the Berlin *Zeitschrift für Ethnologie*, 1886 and later. Dr. Förstemann has likewise published in the *Zeitschrift*, 1891, and also in the *Centralblatt für Bibliothekswesen*, in which remote quarter some of his most thoughtful contributions have appeared; and in the Proceedings of the International Congress of Americanists. Four of his articles bear the general title, "Zur Entzifferung der Mayahandschriften," I, II, III, IV. I refer to them by these numbers. The articles of Professor Thomas, Professor Rau, and Mr. Holden are contained in the annual reports of the Bureau of Ethnology, Washington, where they can be readily consulted by American students.

it is found in the Mexican manuscripts, in my "*Essays of an Americanist*," that I need not enter upon it further in this connection, but would refer the reader to what I have there written.¹

The attempt to frame a real alphabet, by means of which the hieroglyphs could be read phonetically, has been made by various writers.

The first is that preserved in the work of Bishop Landa. It has failed to be of much use to modern investigators, but it has peculiar value as evidence of two facts; first, that a native scribe was able to give a written character for an unfamiliar sound, one without meaning, like that of the letters of the Spanish alphabet; and, secondly, that the characters he employed for this purpose were those used in the native manuscripts. This is proof that some sort of phonetic writing was not unknown.²

This alphabet was extended by the Abbé Brasseur, and especially by de Rosny, who, in 1883, defined twenty-nine

¹ The essays to which I particularly refer are: "The Phonetic Elements in the Graphic Systems of the Mayas and Mexicans;" "The Ikonomatic Method of Phonetic Writing;" "The Writing and Records of the Ancient Mayas;" and "The Books of Chilán Balam." All these are reprinted in my *Essays of an Americanist*, published by Porter & Coates, Philadelphia, 1890. As to how far this or any phonetic system is consistent with the known differences of dialects in the Mayan stock, is a question which space does not permit me to enter upon. I can only say that the signification seems to me to have been fixed in the Maya-Tzental district, and thence carried to the Chortis, Quiches, etc.

² The first copy of Landa's alphabet published in the United States was by myself in the *American Historical Magazine*, 1870. Twenty years later, 1890, in my *Essays of an Americanist*, p. 242, I reproduced a photographic fac-simile of it from the original MS. Though not without considerable value in certain directions, I do not think it worth while to dwell upon it here.

Bishop Landa's important work, *Relacion de las Cosas de Yucatan*, written about 1570, must be carefully read by every student on this branch. It has been twice published, first by the Abbé Brasseur, at Paris, 1864, and more fully at Madrid, under the competent editorship of Juan de Dios de la Rada y Delgado, in 1884. On the relative merits of the two editions, see my "Critical Remarks on the Editions of Diego de Landa's Writings," in the *Proceedings of the American Philosophical Society*, 1887.

letters, with numerous variants from the Codices and inscriptions.¹

Two years later, Dr. A. Le Plongeon published an "Ancient Maya Hieratic Alphabet according to Mural Inscriptions," containing twenty-three letters, with variants. This he applied to the translating of certain inscriptions, but added nothing to corroborate the correctness of the interpretations. Each sign, he believed, stood for a definite letter.²

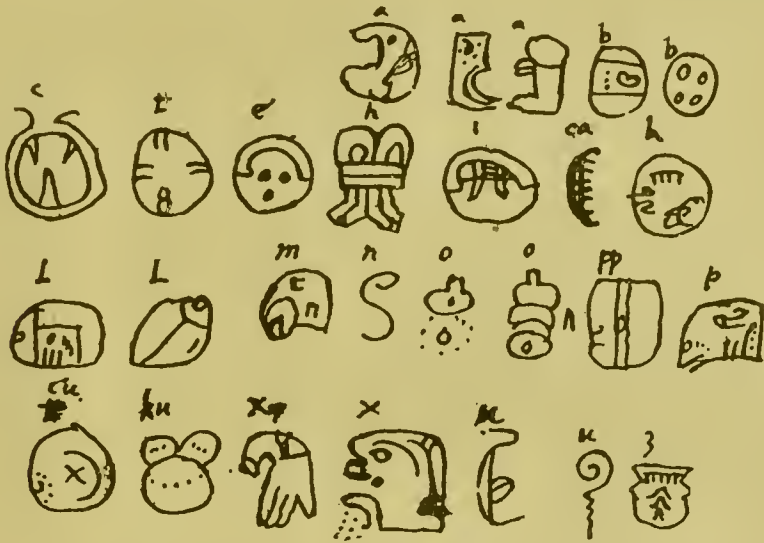


FIG. 1.—Landa's Alphabet; after a photograph from the original manuscript.

Another student who devoted several years to an attempt to reduce the hieroglyphs to an alphabetic form was the late Dr. Hilborne T. Cresson. His theory was that the glyphs stood for the names of pictures worn down to a single phonetic element,

¹ The Abbé Brasseur's whimsical speculations are in his introduction to the Codex Troano, published by the French government in 1869. The chief work of De Rosny on the subject is his *Essai sur le Déciffrement de l'Ecriture Hiératique de l'Amérique Centrale*, folio, Paris, 1876. He fully recognizes, however, that there are also ideographic and pictorial characters as well as phonetic.

² Dr. Le Plongeon's "Alphabet" was published in the Supplement to the *Scientific American*, New York, for January, 1885.

alphabetic or syllabic. This element he conceived was consonantal, to be read with any vowel, either prefixed or suffixed; and the consonant was permutable with any of its class, as a lingual, palatal, etc. On this basis he submitted, shortly before his death in 1894, to the American Association for the Advancement of Science several translations from the Codex Troano. Previous to this, in 1892, he had announced his method in the journal "*Science*," and claimed that he had worked it out ten years before.¹

An alphabet of twenty-seven characters, with variants, which the author considered in every way complete, was published in 1888, by F. A. de la Rochefoucauld.² By means of it he offered a volume of interlinear translations from the inscriptions and codices! They are in the highest degree fanciful, and can have little interest other than as a warning against the intellectual aberrations to which students of these ancient mysteries seem peculiarly prone.

In 1892 Professor Cyrus Thomas, of the Bureau of Ethnology, announced with considerable emphasis that he had discovered the "key" to the Mayan hieroglyphs; and in July, 1893, published a detailed description and applications of it.³ In theory, it is the same as Dr. Cresson's, that is, that the elements of the glyphs were employed as true phonetic elements, or letters. In the article referred to he gives the characters for the following letters of the Maya alphabet: *b, c, c', dz, ch, h, i, k, l, m, n, o, p, pp, t, th, tz, x, v, z*; also for a large number of syllabic sounds which he claimed to have recognized. With such an

¹ At the time of his unexpected death, Dr. Cresson had left with me a full exposition of his theory. His enthusiasm was unbounded, and the sacrifices he had made in the pursuit of archæological science merit for his memory a kindly recognition among students of this subject.

² *Palenqué et la Civilisation Maya* (Paris, 1888). The "Alphabet phonétique des anciens Mayas" is on pp. 10 sqq. The author was at one time attached to the French legation in Guatemala.

³ In the *American Anthropologist*, Washington, D. C.

apparatus, if it had any value, one would expect to reach prompt and important results ; but, aside from the doubtful character of many of his analyses, the fact that this “key” has wholly failed to add any tangible, valuable addition to our knowledge of the inscriptions is enough to show its uselessness ; and the same may be said of all the attempts mentioned.

A slight inspection of the Maya manuscripts and of almost any of the inscriptions will satisfy the observer that they are made up of three classes of objects or elements :—

1. Arithmetical signs, numerals, and numerical computations.
2. Pictures or figures of men, animals, or fantastic beings, of ceremonies or transactions, and of objects of art or utility ; and,
3. Simple or composite characters, plainly intended for graphic elements according to some system for the preservation of knowledge.

I shall refer to these as, (1) the Mathematical Elements, (2) the Pictorial Elements, and (3) the Graphic Elements of the Mayan hieroglyphic writing.

II. The Mathematical Elements.

1. *The Codices as Time-Counts.*

In another work I have explained the numeral system in vogue among the ancient Mayas, as well as the etymology of the terms they employed.¹ It will be sufficient, therefore, to say here that their system was vigesimal, proceeding by multiples of twenty up to very large sums. In the same work I have quoted from original sources the information that the fives up to fifteen were represented by single straight lines and the intermediate numbers by dots. This has also been discovered independently by several students of the manuscripts.

The frequency and prominence of these elementary numerals in nearly every relic of Mayan writing, whether on paper, stone, or pottery, constitute a striking feature of such remains, and forcibly suggest that by far the majority of them have one and the same purpose, that is, *counting*; and when we find with almost equal frequency the signs for days and months associated with these numerals, we become certain that in these records we have before us *time-counts*—some sort of ephemerides or almanacs. This is true of all the Codices, and of nine out of ten of the inscriptions. Here, therefore, is a first and most important step gained toward the solution of the puzzle before us.

But did this incessant time-counting refer to the past or to the future? Was it history or was it prophecy? Or, passing beyond this world, was it astronomy? Was it mythology or ritual, the epochs and the eons of the gods? Perhaps the disposition, sequence, and values of the numbers themselves, once comprehended, will answer these vital questions.

¹ See my Library of Aboriginal American Literature, No. 1: *The Maya Chronicles*, Introduction, pp. 37-50 (Philadelphia, 1882).

2. *The Mayan Numeral System.*

Unfortunately, the old writers, either Spanish or native, tell us little about Maya mathematics. They say the computation ran thus:—

20 units = one *kal*, 20. 20 *pic* = one *calab*, 160,000.
 20 *kal* = one *bak*, 400. 20 *calab* = one *kinchil* or *tzotzceh*, 3,200,000.
 20 *bak* = one *pic*, 8000. 20 *kinchil* = one *alau*, 64,000,000. .

The Tzental system was the same, though the terms differed somewhat: 20 units = one *tab* (cord or net-ful); 20 *tabs* = one *bac*; 20 *bacs* = one *bac-baquetic* (bundle of bacs); 20 *bac-baquetics* = one *mam* (grandfather); 20 *mams* = one *mechun* (grand-mother); 20 *mechuns* = one *mucul mam* (great-grandfather), 64,000,000.¹

No doubt in the numerical notation there were special signs for each of these higher unities; but neither Bishop Landa nor the native writers who composed the singular "Books of Chilán Balam" have handed them down. Modern sagacity, however, has repaired ancient negligence, and we can, almost to a certainty, restore the numerical notation of the aboriginal arithmeticians.

The scholar who has worked most successfully in this field is Dr. Förstemann, the editor of the Codex of Dresden, and I shall introduce a condensed statement of his results, referring the student to his own writings for their demonstration.

3. *Numerical and Allied Signs.*

The first important discovery of Dr. Förstemann in this direction was that of the sign for the naught or cipher, 0. It is given in Fig. 2.² It has a number of variants, some ornamental in design. Next, he discovered the system of notation of high

¹ Vicente Pineda, *Gramatica de la Lengua Tzel-tal*, pp. 154, sqq. (Chiapas, 1887). Pineda makes the multiplier 400 instead of 20, in which he is certainly in error.

² The object portrayed is evidently a *shell*, probably selected as a rebus; but the name of the species I have not found. The ordinary terms are *puy* and *xicin*.

numbers. This is not like ours, but resembles that in use in the arithmetic of ancient Babylonia and some parts of China. The numerals are arranged in columns, to be read from below upward, the value of each unit of a given number being that power of 20 which corresponds to the line on which it stands counted from the bottom. This will be readily understood from the following example :—




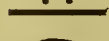

<i>Maya numerals.</i>	<i>Simple values.</i>	<i>Composite values.</i>
	8 (1 = 20 ⁴ , = 160,000 ; hence, 8 × 160,000) =	1,280,000
	11 (1 = 20 ³ , = 8,000 ; “ 11 × 8,000) =	88,000
	8 (1 = 20 ² , = 400 ; “ 8 × 400) =	3,200
	7 (1 = 20 , = 20 ; “ 7 × 20) =	140
	0 (1 = 1 , = 1 ; “ 0 × 1) =	0
	Total	1,377,340

FIG. 2.—Maya Notation.

This would be according to the regular system of the Maya numeration as given above ; but in applying it to the calculations of the native astronomer who wrote the Dresden Manuscript, Dr. Förstemann discovered a notable peculiarity which may extend over all that class of literature. In the third line from the bottom, where in accordance with the above rule the unit is valued at 20 × 20 = 400, its actual value is 20 × 18 = 360.

It immediately suggested itself to him that in time-counts this irregular value was assigned in order that the series might be brought into relation to the old solar year of 360 days, composed of 18 months of 20 days each, in the native calendar.

This correction being made, the above table would read :—

8 (1 = 7200 × 20 = 144,000) =	1,152,000
11 (1 = 360 × 20 = 7200) =	79,200
8 (1 = 20 × 18 = 360) =	2,880
7 (1 = 20) =	140
0 (1 = 1) =	0
	1,234,220

An examination of the mural inscriptions showed that on them also the same plan for the expression of high numbers had been employed, and Dr.

Förstemann was enabled to interpret with accuracy the computations on the monuments from Copan, Quirigua, and Palenque; devel-

oping incidentally the remarkable fact that the inscriptions of Copan contain as a rule higher numbers and are therefore presumably of later date than those of Palenque. The highest is that on "Stela N," as catalogued by Mr. Maudslay, which ascends to 1,414,800 days, or 3930 years of 360 days.¹

The next step was the identification of the graphic signs for the higher unities, 20, 360, and 7200,—corresponding to the native *kal*, *bak*, and *pic*.

That generally used for 20 was identified by several students. It is shown in Fig. 3, No. 3; another also employed under certain circumstances for 20 is shown Fig. 3, No. 2. This was identified independently, first by Pousse, later by Seler.² No. 4 is perhaps a variant of it.

The signs for the *bak*, 360, and the *pic*, 7200, are not so certainly established, but Dr. Förstemann has given cogent reasons for recognizing them respectively in the two shown Fig. 4, Nos. 6 and 7.

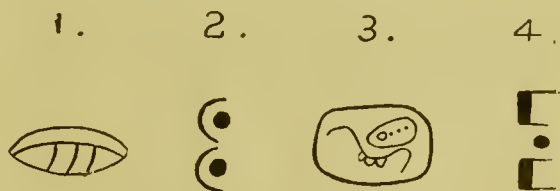


FIG. 3.—Maya Numerals.

¹ Förstemann, *Entzifferung*, No. IV, and Maudslay, *Biologia Centrali-Americana*, *Archæology*. Part IV.

² According to Pousse (*Archives de la Soc. Amer. de France*, 1887, p. 165), it is used to designate the particular day which falls on the 20th of the month, that is, the last day of the month, and has therefore the sense of "last," "final," rather than of 20. It is written as an affix to the month sign. Thomas states that it is used with month symbols "only where the month (of 20 days) is complete or follows one completed." *Amer. Anthropologist*, Vol. VI, p. 246. There is some doubt whether No. 4 is not an element of union. Compare Seler, *Zeitschrift für Ethnologie*, 1887, p. 57.

Higher signs than these in the direct numerical scale have not yet been ascertained; but such plausible reasons have been advanced by Dr. Förstemann for assigning calendar values to certain other signs that they should be added in this description of the numerals.

The first is that shown in Fig. 4, No. 8. It represents the katunic cycle of 52 years of 365 days each, = 18,980 days. The second is No. 9. This is taken to be the sign of the *ahau katun*, 24 years of 365 days, = 8760 days. The third is No. 10. This corresponds to one-third of an *ahau katun*, = 2920 days. The fourth, shown No. 11, is an old cycle of 20 years of 360 days, = 7200. No. 12 means an old katunic cycle of 52 years of 360 days, = 18,720 days, and No. 13 an old year of 360 days.¹



FIG. 4.—Calendar Signs.

There are also a series of other signs evidently connected with the numerals, the precise value of which is yet undetermined. One of these is a small right or oblique cross, or sometimes two

¹ Dr. Förstemann's article, "Zur Maya-Chronologie," assigning the reasons for these identifications, appeared in the Berlin *Zeitschrift für Ethnologie*, 1891.

arcs abutting against each other, connected or not. It is usually by the side of a single dot or unit, or between two such. In certain places, it seems to be a multiplier with the value 20; in others, it would indicate a change or alternation in the series presented of days or years. (See Fig. 5, Nos. 1-4.)


Of somewhat similar value are the calendar signs , Fig. 4,



FIG. 5.—Numeral Signs.

Nos. 2, 3, 4, like an *S* placed lengthwise. This is also understood to be a sign of alternation or change of series of years or cycles.

Of an opposite sense is the sign No. 5, the spiral, and also the sign No. 1, both of which are held to represent union.

This list exhausts the mathematical signs so far as they have been ascertained with probability. Those for high numbers brought forward by Brasseur,¹ have no evidence in their favor.


Mr. Maudslay has offered reasons for believing that the character in Fig. 6, *a*, stands for the numeral 20 in a certain class of mural inscriptions.² He further

FIG. 6.—The "Cosmic Sign" and its Combinations.

¹ *Etude sur le Manuscrit Troano*, p. 220.

² A. P. Maudslay: *Biologia Centrali-Americana; Archaeology*, Part II. Text, pp. 40-42 (London, 1890). The character *b* closely resembles the day-sign *chuen*. This could readily be chosen to express ikonometrically *chun*, "the beginning, the first," and my studies convince me that it repeatedly must be so understood. To this I shall recur on a later page.

points out that the character *b* is not unfrequently united with *a*, and that it (*b*) almost alone of the mural glyphs is found with a double set of numerals attached to it as in *c*. One or both these sets of numerals are at times replaced by the sign *a*, giving the composites *d*, *e*, and *f*. It is thus evident that *a* has some numerical or calendar meaning. As a character itself, it is the "cosmic sign," conveying the idea of the world or universe as a whole, as is seen by the examples to which Mr. Maudslay refers, from various Codices. The cross-hatching upon it means, as I shall show later, "strong, mighty," and is merely a superlative. It may very well mean 20, as that is the number conveying completeness or perfection in this mythology.¹ That it appears on what Mr. Maudslay calls the "Initial Series" of glyphs (which I consider terminals), is explained by the nature of the computations they preserve. Another combination, belonging most likely to a similar class,

is the following  where the "cosmic sign" is united as a superfix to the *pax* and the flint. It has usually been explained as a "phallic emblem," and by Thomas as "tortillas."²

4. *The Rhetorical and Symbolic Use of Numbers.*

In the old Maya language we find that certain numbers were used in a rhetorical sense, and this explains their appearance in some non-mathematical portions of the Codices and inscriptions. The two most commonly employed were 9 and 13. These conveyed the ideas of indefinite greatness, of superlative excellence,

¹ Since the above was written, Mr. Stewart Culin, Director of the museum of the University of Pennsylvania, has called my attention to the fact that the cross-hatching on the "cosmic sign" would, in Oriental, especially Chinese symbolism, convey the idea of the fundamental dual principles of existence,—male and female, upper and lower, etc. The same interpretation may quite possibly apply in the Mayan symbolism.

² See my *Native Calendar of Central America*, pp. 49-59 (Philadelphia, 1893).

of infinity, etc. A very lucky man was a "nine-souled man;" that which had existed forever was "thirteen generations old," etc. The "demon with thirteen powers" was still prominent in Tzental mythology in the time of Nuñez de la Vega. Other numerals occasionally employed in a symbolic sense were 3, 4, and 7.¹

All these occur in the Codices as prefixes in relations where they are not to be construed in their arithmetical values, but in those assigned them by the usages of the language or the customs of religious symbolism. Thus, "twenty," owing to the vigesimal method of numeration, conveyed the associated ideas of completeness and perfection; and as the month of 20 days was divided into four equal parts of 5 days each, by which markets, etc., were assigned, these numbers also stood independently for other concepts than those of computation.

5. *The Mayan Methods of Counting Time.*

Having ascertained the characters for the numerals, and having learned that these records are mainly time-counts, the next question which arises is: How did the Mayas count time?

About this we have considerable information from the works of the Spanish writers, Landa, Aguilar, Cogolludo, Pio Perez, etc., which has been supplemented by the researches of modern authors.

The Maya system was a complicated one, based on several

¹The dictionaries give: "*bolon pixan*, bien aventurado;" "*bolon dzacab*, and *oxlahun dzacab*, "cosa eterna." The numeral "one," as in English, had a superlative sense, as *hun miaz*, "the one scholar," *i. e.*, the most distinguished. Why a symbolic or superlative sense was attached to such numbers is a question too extensive to discuss here. I have touched upon it in my *Native Calendar of Central America*, pp, 8, 13, and in an article on "The Origin of Sacred Numbers" in *The American Anthropologist*, April, 1894. In another connection we find *maay*, odor from something burning; "*bolonmayel*, cualquier olor suavissimo y transcendente"—*Dicc. Motul*. Dr. Seler has suggested that the number 13 may refer to the thirteen heavens; but offers no evidence that the Mayas entertained the Nahuatl myth to which this refers.

originally distinct methods, which it was the duty and the aim of the astronomer-priests to bring into unison,—and the effort to accomplish this will chiefly explain their elaborate computations.

Undoubtedly their earliest time-count was that common to primitive tribes everywhere—a measurement of the solar year by lunations or “moons.” The exact lunar month is 29 days, 12 hours, 44 minutes, 3 seconds; but primitive peoples usually estimate it at 28 days, and allow 13 months to the solar year, as do yet many North Asiatic peoples, and as probably did the early Aryans;¹ or, they estimate the “moon” at 30 days, and allow 12 moons to the year. There are good grounds for believing that the Mayan tribes were at one time divided in custom about this, some using one, some the other method. At the time of the Conquest they had undoubtedly reached a knowledge of the length of the year as 365 days; and there is considerable probability that some of them at least made the correction arranged for in our bissextile or leap year.²

This is all familiar enough and would create no difficulty in deciphering these aboriginal almanacs; but a disturbing element enters. The real time-count by which they adjusted the important events of their lives, and which is most prominent in their records, had nothing to do with the motions of the sun, or

¹ Schrader: *Prehistoric Antiquities of the Aryan Peoples*, pp. 307-9.

² To enter into this debated question at length would not be possible in this connection; but I would merely note: (1) The positive assertion of Landa that the Maya year “invariably” began July 16 (*Cosas de Yucatan*, p. 236), could not be true even for five years, unless the bissextile correction was made, which he asserts was done; (2) the example of a Maya year given by Aguilar (*Informe contra Idolos Cultores del Obispado de Yucatan*, Madrid, 1639), is actually one containing six intercalary days, “*seis dias que fueron sus cauculares*;” and (3) Father Martin de Leon, in his “*Calendario Mexicano*,” pointedly states that the fourth year was a bissextile year (*Camino del Cielo*, fol. 100, Mexico, 1611). I do not maintain that this knowledge was general, but that it had been acquired by the astronomer-priests of certain localities. The investigations of Mrs. Zelia Nuttall tend to demonstrate this opinion.

the moon, or any other natural phenomenon. It was based on purely mythical relations supposed to exist between man and nature. As the number 20 (fingers and toes) completes the man, and as all the directions, that is, potencies, of the visible and invisible worlds were held to be 13, these two numbers, 13 and 20, formed the basis of an astrological and ritual calendar, by which auspicious and inauspicious days were assigned, future events foretold, the major feasts and festivals of religious worship dictated, and the like.

This singular time-count of $20 \times 13 = 260$ days was adopted with slight variations by every semi-civilized nation of Mexico and Central America, and even the names of the 20 days are practically of the same meaning in all these languages.¹ It constituted the *tonalamatl* of the Nahuas, the "Book of Days," used in divination.

This sacred period was subdivided into four equal parts of 65 days each, each of which was assigned to the rule of a special planet or star, and to a particular cardinal point with attendant divinities; and each was marked with a color of its own, white, black, red, or blue.

Each "month" of 20 days was subdivided into four periods of five days each, again each having its own divinity, assignment, etc.

But the importance to us of the *tonalamatl* is that its computations underlay the measurement of long periods of time, the less and greater cycles. These were estimated by the methods of the sacred year, in groups of 13, 20, 24, 52, 104, 260 years, etc. These irregular numbers had to be brought into unison with the lunar and solar years, with the vigesimal system of counting by 20 and its multiples, and with the observed motions of the planets, who were divinities controlling the ritual divisions of time.

To devise a mathematical method of equalities and differences

¹ On these points I would refer the reader to my work, *The Native Calendar of Central America and Mexico; A Study in Linguistics and Symbolism* (Philadelphia, 1893).

by which these conflicting numbers could be placed in harmonious relations, subsumed under common measures, and the ceremonies and forecasts which they controlled assigned by uniform laws—this is the arithmetical problem which fills the pages of the Mayan Codices, and in parts or at length is spread over the surface of the inscribed monuments and painted vases. We need not search for the facts of history, the names of mighty kings, or the dates of conquests. We shall not find them. Chronometry we shall find, but not chronicles; astronomy with astrological aims; rituals, but no records. Pre-Columbian history will not be reconstructed from them. This will be a disappointment to many; but it is the conclusion toward which tend all the soundest investigations of recent years.

Let us recapitulate the numbers which the Maya mathematician had to deal with and adjust under some scheme of uniformity:—

1. The "week" of 13 days, 13.
2. The "month" of 20 days, 20.
3. Its division into four parts (called *tzuc*), each, 5.
4. The complete *tonalamatl*, 13×20 days, 260.
5. Its divisions into four parts, each, 65.
6. The solar year, counted as 18 months of 20 days each, . . 360.
7. The solar year, counted as 12 months of 30 days each, . . 360.
8. The solar year, counted as 13 lunar months of 28 days
each, 364.
9. The solar year, counted as 28 weeks of 13 days each, . . 364.
10. The true solar year, days, 365.
11. The bissextile year (?), 366.
12. The apparent revolution of Venus (*Noh-ek*, the Great Star),
days, 584.
13. The apparent revolution of Mercury (?), days, 115.
14. The apparent revolution of Mars (?), days, 780.
15. The *kin katun*, or day-cycle of years, 13.
16. The older cycle of years, 20.
17. The newer cycle of years, 24.
18. The *katun* cycle of years, 52.
19. The double cycle of years, 104.
20. The great cycle of years, 260.

6. *The Calculations in the Codices.*



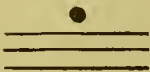


The Codices contain numerous calculations intended to bring these various quantities into definite relations as aliquot parts of some arithmetical whole, which might be taken as a general unit. The scribes appear to have begun by establishing a period of 14,040 days. This equals 39 years of 360 days each, and also 54 years of 260 days each, together, of course, with the divisors of these numbers, 13, 18, 20, 65, etc. Then followed the determination of the period of 18,980 days, = 73 *tonalamatl*, = 52 solar years, so prominent in the calendar and ritual of the Nahuas.

This number, however, could not be adjusted to the cycle of the *ahan katun*, which was 24 years of 365 days each;¹ nor to the ceremonially prominent revolution of "the Great Star," Venus, which coincides with the Earth's revolutions in 2920 days, or eight solar years. To bring these into accord with the *tonalamatl* required a period of 104 solar years, or 37,960 days; and to adjust under one number the *katuns*, the *ahan katuns*, the revolutions of Venus, the solar year, and the *tonalamatl*, three times that number of days are required, that is, 113,880, = 312 years.

This period had still to be brought into relation to the old year of 360 days, and this requires the estimation of a term covering 1,366,560 days, or 3744 years; and this extended era we find expressed in the Dresden Codex, page 24, in the following simple notation, the interpretation of which into our system of calculation, according to the method above explained, I add to the right.

¹ Professor Cyrus Thomas, in his carefully written article, "The Maya Year," in the *Bulletins* of the Bureau of Ethnology (Washington, 1894), has collected evidence that the same calendar system, based, he believes, on the year of 365 days, was used in Palenque, Menche (Lorillard City), and Tikal, as well as in the Cod. Dresdensis. That the Mayas had, at the time of the Conquest, long known the year of 365 days, was demonstrated from the Codices by Dr. Förstemann. (See his *Erläuterungen zur Maya-Handschrift*, Dresden, 1886, p. 21, and his "Die Zeitperioden der Mayas," in *Globus*, January, 1892).

This long period allowed all their important time-measures to be dealt with as aliquot parts of one whole, and would seem to be sufficient for the purposes they had in view. The credit of establishing it from their ancient writings is exclusively due to Dr. Förstemann, whose demonstrations of it appear to be conclusive.¹

	9 (unit = 144,000) = 1,296,000
	9 (unit = 7,200) = 64,800
	16 (unit = 360) = 5,760
	0 (unit = 20) = 0
	0 (unit = 1) = 0
	Total, 1,366,560

This acute observer has, however, discovered some reasons to suppose that the native priests occasionally contemplated a much more extended era; some of their calculations seem to require an era which embraced 12,299,040 days, that is, 33,696 years!²

No doubt each of these periods of time had its appropriate name in the technical language of the Maya astronomers, and also its corresponding sign or character in their writing. None of them has been recorded by the Spanish writers; but from the analogy of the Nahuatl script and language, and from certain indications in the Maya writings, we may surmise that some of these technical terms were from one of the radicals meaning "to tie, or fasten together," and that the corresponding signs would

¹ See especially his articles, *Die Zeitperioden der Mayas*, 1892, and his *Zur Entzifferung der Maya-Handschriften*, IV, 1894.

² The grounds for this opinion are stated in his *Zur Entzifferung*, etc., No. II.

either directly, that is, pictorially; or ikonomatically, that is, by similarity of sound, express this idea.

Proceeding on the first of these suppositions, Dr. Förstemann has suggested that the character, Fig. 4, No. 8, signifies the period of 52 years, the Nahuatl *xiuhmolpilli*, "the tying together of the years," represented in the Aztec pictographs by a bundle of faggots tied with cords. The Maya figure is explained as the day-sign *imix*, representing the first day of the calendar, and, by a kind of synecdoche, the whole calendar, with a superfix.

7. *Rules for Tracing the Tonalamatl, or Ritual Calendar.*

That the computations of the *tonalamatl* underlie most of the numerals in the Codices is shown by the rules for reading them, formulated by Pousse with reference to the red and black numerical signs. These rules are as follows:—¹

1. If to a red number be added the black number immediately following it, the total less 13 (or its multiples, when the total is above 13) equals the next following red number.

2. When the red and black numbers are written alternately on the same line, they are to be read from left to right; when written one above the other, they are to be read from below upward; when in two vertical columns, they are to be read passing from one column to the other, beginning with the first black number on the left, passing to the first black number on the right, returning to the second black number on the left, and so on.

Sequences of this kind are governed by the following rules:—

1. In any of the above systems the beginning is always marked by one or more columns of days surmounted by a number.

2. This number is always the same as that which ends the series, and both are written in red.

3. The sum of the numbers written in black, multiplied by the number of days with different names represented by the

¹ A. Pousse, in *Archives de la Société Américaine de France*, 1886, 1887.

hieroglyphs attached, always equals 260, that is, the number of days in the *tonalamatl*.

The above rules enable the student to recognize the relations of the different parts of the Codices. They prove, for instance, that the pages are not to be read from top to bottom, but that the separate parts or chapters are to be read in many instances from left to right in the section of the page in which they begin, without respect to the folds of the MSS.; and that evidently in reading these "books" they were unfolded and spread out. A good example of this is in Cod. Dresden, pages 4-10, on which one chapter covers all the upper thirds of the seven pages.

8. *The Codices as Astronomical Treatises.*

A careful examination of Dr. Förstemann's remarkable studies, as well as a number of other considerations drawn from the Codices themselves, have persuaded me that the general purpose of the Codices and the greater inscriptions, as those of Palenque, have been misunderstood and underrated by most writers. In one of his latest papers¹ Professor Cyrus Thomas says of the Codices: "These records are to a large extent only religious calendars;" and Dr. Seler has expressed his distrust in Dr. Förstemann's opinions as to their astronomic contents. My own conviction is that they will prove to be much more astronomical than even the latter believes; that they are primarily and essentially records of the motions of the heavenly bodies; and that both figures and characters are to be interpreted as referring in the first instance to the sun and moon, the planets, and those constellations which are most prominent in the nightly sky in the latitude of Yucatan.

This conclusion is entirely in accordance with the results of the most recent research in neighboring fields of American culture. The profound studies of the Mexican Calendar undertaken by Mrs. Zelia Nuttall have vindicated for it a truly surprising ac-

¹ In the *American Anthropologist* for July, 1893.

curacy which could have come only from prolonged and accurately registered observations of the relative apparent motions of the celestial bodies.¹ We may be sure that the Mayas were not behind the Nahuas in this; and in the grotesque figures and strange groupings which illustrate the pages of their books we should look for pictorial representations of astronomic events.

Of course, as everywhere else, with this serious astronomic lore were associated notions of astrology, dates for fixing rites and ceremonies, mythical narratives, cosmogonical traditions and liturgies, incantations and prescriptions for religious functions. But through this maze of superstition I believe we can thread our way if we hold on to the clue which astronomy can furnish us. In the present work, however, I do not pretend to more than prepare the soil for such a labor.

A proof of the correctness of this opinion and also an admirable example of the success with which Dr. Förstemann has prosecuted his analysis of the astronomical meaning of the Codices is offered by his explanation of the 24th page of the Dresden Codex, laid before the International Congress of Americanists, in 1894.

He showed that it was intended to bring the time covered in five revolutions of Venus into relation to the solar years and the ceremonial years, or *tonalamatl*, of 260 days; also to set forth the relations between the revolutions of the Moon and of Mercury; further, to divide the year of Venus into four unequal parts, assigned respectively to the four cardinal points and to four divinities; and, finally, to designate to which divinities each of the five Venus-years under consideration should be dedicated.

This illustrates at once the great advance his method has made in the interpretation of the Codices, and the intimate relations we find in them between astronomy and mythology.

¹ See her "Note on the Ancient Mexican Calendar System," communicated to the Tenth International Congress of Americanists, Stockholm, 1894.

Such a theory of the Mayan books which we have at hand is world-wide distant from that of Thomas and Seler. Take, for example, the series of figures, Cod. Cort., pp. 14^a, 15^a, 16^a.¹ Förstemann and myself would consider them to represent the position of certain celestial bodies before the summer solstice (indicated by the turtle on p. 7); while Thomas says of them, "It may safely be assumed that these figures refer to the Maya process of making bread!!"²

9. *Astronomical Knowledge of the Ancient Mayas.*

Our information from European sources as to the astronomical knowledge possessed by the Mayas is slight.

That they looked with especial reverence to the planet Venus is evident from the various names they applied to it. These were: *Noh Ek*, "the Great Star" or "the Right-hand Star;" *Chac Ek*, "the Strong Star" (or "the Red Star"); *Zastal Ek*, "the Brilliant Star;" *Ah-Zahcab*, "the Controller or Companion of the Dawn;"³ and *Xux Ek*, "the Bee or Wasp Star," for reasons which will be considered later. In the Tzental dialect it was called *Canan Chulchan*, "the Guardian of the Sky," and *Mucul Canan*, "the Great Guardian."

The North Star was well known as *Xaman Ek* (*xaman*, north, *ek*, star), and also as *Chimal Ek*, "the Shield Star," or "Star on the Shield."⁴ It was spoken of as "the Guide of the Merchants" (*Dicc. de Motul*), and therefore was probably one of their special divinities.

The historian Landa states that the Mayas measured the pas-

¹ As the pages of the Codices are generally divided into compartments by transverse lines, the custom of students is to designate these from above downward by small letters added to the number of the page.

² In *American Anthropologist*, July, 1893, p. 262.

³ "El lucero de la mañana, que parece hacer amanecer." *Dicc. de Motul*.

⁴ Like *chimal ik*, "north wind." *Chimal* is the Nahuatl *chimalli*, shield, so these terms must be of late origin in Maya.

sage of time at night by observations of the Pleiades and Orion.¹ The name of the former in their language is *Tzab*, a word which also means the rattles of the rattlesnake. In the opinion of Dr. Förstemann,² their position in the heavens decided the beginning of the year (or, perhaps, cycle, as with the Nahuas), and they were represented in the hieroglyphs by the *moan* sign (to be explained on a later page).

Certain stars of the constellation Gemini were defined, and named *Ac*, or *Ac Ek*, "the Tortoise Stars," from an imagined similarity of outline to that of the tortoise.³ This may explain the not infrequent occurrence of the picture of that animal in the Codices, and its representations in stone at Copan and elsewhere.

The terms for a comet in Maya were *Budz Ek*, "Smoking Star," and *Ikomne*, "Breathing or Blowing," as it was supposed to blow forth its fiery train; in Tzental it was *Tza Ec*, "Star Dust." Shooting stars were *Chamal Dzutan*, "Magicians' Pipes," as they were regarded as the fire-tubes of certain powerful enchanters.

The stars in Orion were known as *Mehen Ek*, "the Sons," doubtless referring to some astronomical myth.

The Milky Way was spoken of under two different names, both of obscure application, *Tamacas* and *Ah Poou*. Another meaning of the former word is "madness, insanity;" and the latter term was also applied to a youth who had just attained the age of puberty.⁴ Perhaps the connection of the word lies in the ceremonies of initiation practiced by many tribes when a youth reached this age, and which, by fasting and the administration of

¹ "Regianse de noche, para conocer la hora, por el lucero, i las cabrillas i los astilejos; de dia, por el medio dia." Landa, *Cosas de Yucatan*, cap. 34.

² *Entzifferung der Mayahandschriften*, No. IV.

³ "Las tres estrellas juntas que estan en el signo de Geminis, las quales, con otras, hacen forma de tortuga." *Dicc. de Motul*.

⁴ These definitions are given in the *Dicc. Motul*.

toxic herbs, often led to temporary mania ; and the deity of the Milky Way may have presided over these rites.

The moon in opposition was referred to as *u nupptanba*, from *nup*, opposed, opposite. When in conjunction, the expression was *hunbalan u*, "the rope of the moon," or, "the moon roped." When it was in eclipse, it was *chibil u*, "the moon bitten," the popular story being that it was bitten by a kind of ant called *xulab*. An eclipse of the sun was also *chibil kin*, "the sun bitten;" but more frequently the phrase was *tupul u uich kin*, or, *tupan u uich kin*, "the eye of the day is covered over," or, "shut up." It is useful to record such expressions, as they sometimes suggested the graphic representations of the occurrences.¹

¹ In Cod. Peres., pp. 18, 19, the sun is shown bitten by birds, snakes, etc. We probably have in this a reference to an eclipse. On a later page I shall show the hieroglyph of the double loop of the rope, which probably signifies the moon in conjunction.

III. The Pictorial Elements.

To understand the pictorial portions of the inscriptions some acquaintance with the native mythology is indispensable.

1. *The Religion of the Ancient Mayas.*

The religion of the Mayas was a polytheism, but the principal deities were few in number, as is expressly stated by Father Francisco Hernandez, the earliest missionary to Yucatan (1517);¹ and these, according to the explicit assertion of Father Lizana, were the same as those worshipped by the Tzentals of Tabasco and Chiapas.² Both these statements are confirmed by a comparison of the existing remains, and they greatly facilitate a comprehension of the Codices and epigraphy.

The spirit of this religion was dualistic, the gods of life and light, of the sun and day, of birth and food, of the fertilizing showers and the cultivated fields, being placed in contrast to those of misfortune and pain, of famine and pestilence, of blight and night, darkness and death. Back of them all, indeed the source of them all, was *Hunab Ku*, "the One Divine;" but of him no statue and no picture was made, for he was incorporeal and invisible.³

Itzamna.—Chief of the beneficent gods was *Itzamna*. He was the personification of the East, the rising sun, with all its manifold mythical associations. His name means "the dew or

¹ The account of Hernandez is given by Las Casas, *Historia de las Indias*, cap. CXXIII. The monk says that the principal lords alone knew the histories of the gods.

² Lizana's work, of which only one complete copy is known to exist (in Madrid), has been partly republished by Brasseur in the Appendix to Landa, *Cosas de Yucatan*. He says the votaries came from Chiapas and Tabasco, p. 359.

³ The *Dicc. Motul* defines *Hunab Ku* thus: "the one true and living God; the greatest of all the gods of Yucatan was so named, and he had no idol, because they said that he could not be represented, seeing that he was incorporeal." This dictionary, to which I shall often refer, is one of the Maya language, composed at the Convent of Motul, about 1570. A copy is in my possession.

moisture of the morning," and he was the spirit of the early mists and showers. He was said to have come in his magic skiff from the East, across the waters, and therefore he presided over that quarter of the world and the days and years assigned to it.

For similar reasons he received the name *Lakin chan*, "the Serpent of the East," under which he seems to have been popularly known. As light is synonymous with both life and knowledge, he was said to have been the creator of men, animals, and plants, and was the founder of the culture of the Mayas. He was the first priest of their religion, and invented writing and books; he gave the names to the various localities in Yucatan, and divided the land among the people; as a physician he was famous, knowing not only the magic herbs, but possessing the power of healing by touch, whence his name *Kabil*, "the skilful hand," under which he was worshipped in Chichen Itza. For his wisdom he was spoken of as *Yax coc ah-mut*, "the royal or noble master of knowledge."

Cuculcan.—In some sense a contrast, in others a completion of the mythical concepts embodied in Itzamna, was *Cuculcan* or *Cocol chan*, "the feathered or winged serpent."¹ He also was a hero-god, a deity of culture and of kindliness. He was traditionally the founder of the great cities of Chichen Itza, and Mayapan; was active in framing laws and introducing the calendar, at the head of which some Maya tribes placed his name; was skilled in leechcraft, and was spoken of as the god of chills and fevers.

As Itzamna was identified with the East, so was Cuculcan with the West. Thence he was said to have come, and thither returned.² In the Tzental calendars he was connected with the

¹ In my work, *American Hero-Myths* (Philadelphia, 1882), Chap. IV, "The Hero-gods of the Mayas," I have treated at considerable length the duplicate traditions relating to Itzamna and Cuculcan.

² "Todos conforman en que este (Cuculcan) entró por la parte del poniente."

seventh day (*moxic*, Maya, *manik*); hence he is mystically associated with that number. He corresponds to the *Gukumatz* of the Quiche mythology, a name which has the same signification.

In the myth he is described as clothed in a long robe and wearing sandals, and, what is noteworthy, *having a beard*. In the calendars of the Tzents he was painted "in the likeness of a man and a snake," and the "masters" explained this as "the snake with feathers, which moves in the waters," that is, the heavenly waters, the clouds and the rains; for which reason Bishop Nuñez de la Vega, to whom we owe this information, identified him with the Mexican Mixcoatl, "the cloud serpent;"¹ whereas Bishop Landa was of opinion that he was the Mexican Quetzalcoatl.

Kin ich.—As Itzamna was thus connected with the rising, morning sun, and Cuculcan with the afternoon and setting sun, so the sun in the meridian was distinguished from both of them. As a divinity, it bore the name *Kin ich*, "the eye or face of the day." The sacrifices to it were made at the height of noontide, when it was believed that the deity descended in the shape of the red macaw (the *Ara macao*), known as *Kak mo*, "the bird of fire," from the color of its plumage, and consumed the offering. Such ceremonies were performed especially in times of great sickness, general mortality, the destruction of the crops through locusts, and other public calamities. It seems probable from the accounts that *Kin ich* was a much less prominent divinity in the popular mind than either of the other two solar deities, and his attributes were occasionally assigned to Itzamna,

Herrera, *Historia de las Indias*, Dec. IV, cap. 2. Looking toward the North, Itzamna was the right-hand god, Cuculcan the left-hand; hence, the arrival of the former was called *nohnial*, "right-hand coming," of the latter, *dzicnial*, "left-hand coming." (Cogolludo, *Hist. de Yucatan*, Lib. IV, cap. IV.)

¹ "En los Repertorios mas generales tienen pintado el 7 signo en figura de hombre y de Culebra, que llaman *Cuchul chan*, y han explicado los Maestros que es culebra de plumas que anda en el agua." Nuñez de la Vega, *Constituciones Diocesanas*, Parte II, p. 132.

as we find the combination *Kin ich ahau Itzamna* among the names of divinities.

Other Gods.—To Itzamna was assigned as consort *Ix Chel*, "the rainbow," also known as *Ix Kan Leom*, "the spider-web" (which catches the dew of the morning). She was goddess of medicine and of childbirth, and her children were the *Bacabs*, or *Chacs* (giants),¹ four mighty brethren, who were the gods of the four cardinal points, of the winds which blow from them, of the rains these bring, of the thunder and the lightning, and consequently of agriculture, the harvests, and the food supply. Their

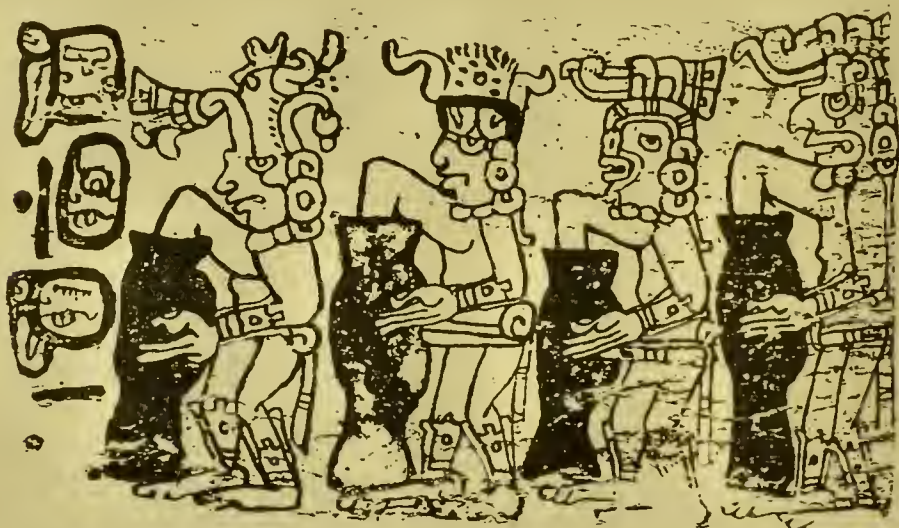


FIG. 7.—The Beneficent Gods draw from their Stores. (Photographed from the Cortesian Codex.)

position in the ritual was of the first importance. To each were assigned a particular color and a certain year and day in the calendar. To *Hobnil*, "the hollow one" or "the belly," were given the south, the color yellow, and the day and years *kan*,

¹ The word *chac* means "strong; the color red; heat; water." The *Dicc. Motul* says: "Significa agua en algunas maneras de decir; tambien dios de las aguas, relampago y trueno; *chacal ik*, tempestad de agua, huracan."

the first of the calendar series, and so on. The red Bacab was to the east, the white to the north, and the black, whose name was *Hozan Ek*, "the Disembowelled," to the west.¹

The Cardinal Points.—Much attention has been directed to these divinities as representing the worship of the cardinal points and to the colors, days, cycles, and elements mythically associated with them. Uniform results have not been obtained, as the authorities differ, as probably did also the customs of various localities.² Pio Perez assigns *kan* to the east, *muluc* to the north, *ix* to the west, and *cauac* to the south. The arrangement based on Landa's statements would be as follows :—

<i>Cardinal point.</i>	<i>Bacab.</i>	<i>Days.</i>	<i>Colors.</i>	<i>Elements.</i>
South,	Hobnil (the Belly),	Kan,	Yellow,	Air.
East,	Canzicnal (Serpent Being),	Muluc,	Red,	Fire.
North,	Zaczini (White Being),	Ix,	White,	Water.
West,	Hozan ek (the Disembowelled Black one),	Cauac,	Black,	Earth.

On the other hand, it should be noted that the names of the winds in Maya distinctly assign the color white to the east, thus :—

East wind,	<i>zac ik</i> , "white wind."
Northeast wind,	<i>zac xaman ik</i> , "white north wind."
Southeast wind,	<i>zac nohol ik</i> , "white south wind."

The solution of these difficulties must be left for future investigation.

The Good Gods.—Divinities of a beneficent character were *Yum Chac*, "Lord of Waters or Rains;" *Yum Kaax*, "Lord of the Harvest Fields;" *Cum Ahau*, "Lord of the Vase," that is,

¹ Mr. J. Walter Fewkes is certainly correct in his argument that the "ceremonial circuit," of the Mayas,—the direction of movement in their ceremonies—was sinistral, that is, from right to left, in most instances. This should be remembered in studying the pictorial portion of the Codices. See Mr. Fewkes' article, "A Central-American Ceremony," in the *American Anthropologist*, July, 1893.

² An article by Dr. C. Schultz-Sellack, entitled "Die Amerikanischen Götter der vier Weltrichtungen," in the *Zeitschrift für Ethnologie*, Bd. XI, may be profitably read in this connection, though some of its statements are antiquated.

of the rains, who is described in the Dic. Motul as "Lucifer, Chief of the Devils" and is probably a name of Itzamna; *Zuhuy Kak*, "Virgin Fire," patroness of infants; *Zuhuy Dzip*, "The Virgin of Dressed Animals," a hunting goddess; *Ix Tabai*, "Goddess of the Ropes or Snares," also a hunting goddess as well as the patroness of those who hanged themselves; *Ah Kak Nech*, "He Who Looks after the Cooking Fire," *Ah Ppua*, "the Master of Dew," and *Ah Dsis*, "The Master of Cold," divinities of the fishermen.

To this list should be added *Acan*, "the God of the Intoxicating Mead," the national beverage, that being its name; *Eh Chua*, "the Black Companion," god of the cacao planters and the merchants, as these used the cacao beans as a medium of exchange; *Ix Tub Tun*, "she who spits out Precious Stones," goddess of the workers in jade and amethysts; *Cit Bolon Tun*, "the Nine (*i. e.*, numberless) Precious Stones," a god of medicine; *Xoc Bitum*, the God of Singing, and *Ah Kin Xoc* or *Ppis Lim Tec*, the God of Poetry (*xoc*, to sing or recite); *Ix Chebel Yax*, the first inventress of painting and of colored designs on woven stuffs (*chebel*, to paint, and a paint-brush).

A minor deity was *Tel Cuzaan*, "the swallow-legged," a divinity of the island of Cozumel ("Swallow Island").

On a lofty pyramid, where is now the city of Valladolid, Yucatan, was worshipped *Ah sakik ual*, "Lord of the East Wind." His idol was of pottery in the shape of a vase, moulded in front into an ugly face. In it they burned copal and other gums. His festival was celebrated every fourth year with sham battles.¹ Probably this was a representation of Itzamna as lord of the cardinal point.

The "Island of Women," *Isla de Mujeres*, on the east coast, was so named because the first explorers found there the statues of four female divinities, to whom altars and temples were dedi-

¹ *Relacion de la Villa de Valladolid* (1579), caps. I and X. This *Relacion* was printed in the *Compte Rendu* of the Congress of Americanists, the Madrid Meeting.

cated.¹ They were *Ix-chel*, *Ix-chebel-yax*, *Ix-hun-jé*, and *Ix-hun-yeta*. The first two have already been mentioned. The last two seem to have been goddesses connected with the moon-rise and sunrise, as the dictionaries give as the meaning of *jé*, "to show one's self, to appear;" as in the phrases *yethas y ahal-cab*, "at the appearance of the dawn;" *yethas u hokol u*, "at moonrise;" *yct hokol kin*, "at sunrise."

Prominent among mythical beings were the dwarfs, known as *ppus*, "bent over;" *ac uinic*, "turtle men;" *tsapa uinic*, "shortened men;" and *pputum*, "small of body." They are sometimes represented in the carvings, an interesting example being in the Peabody Museum. A legend concerning such brownies was that before the last destruction of the world the whole human race degenerated into like diminutive beings, which prompted the gods to destroy it.² One class of these little creatures, called *acat*, were said to become transformed into flowers.

As I have shown elsewhere,³ many similar superstitions survive in the folk-lore of Yucatan and Tabasco to-day. But it is not safe to look at such survivals as part of genuine ancient mythology. For instance, the goddess *Ix-nuc*, or *Xnuc*, said by Brasseur to have been goddess of the mountains, by Seler, goddess of the earth, and by Schellhas, goddess of water, is in fact not a member of the Maya Pantheon. The name means simply "old woman," and was first mentioned by an anonymous modern writer in the *Registro Yucateco*.

The Gods of Evil.—In contrast to the beneficent deities were those who presided over war, disease, death, and the underworld. Distinctively war gods were *Uac Lom Chaam*, "He

¹ Landa, *Rel. de las Cosas de Yucatan*, p. 72 (Madrid Ed.). The ruins of this ancient fane are still plainly visibly from the sea. J. L. Stephens, *Travels in Yucatan*, vol. II, p. 358.

² Carrillo, *Historia Antigua de Yucatan*, p. 207.

³ See the article "The Folk-lore of Yucatan," in my *Essays of an Americanist* (Philadelphia, 1890).

whose teeth are six lances," worshipped anciently at Ti-ho, the present Mérida; *Ahulane*, "The Archer," painted holding an arrow, whose shrine was on the island of Cozumel; *Pakoc* (from *paakal*, to frighten) and *Hex Chun Chan*, "The dangerous one," divinities of the Itzaes; *Kak u pacat*, "Fire (is) his face," who is said to have carried in battle a shield of fire; *Ah Chuy Kak*, "He who works in fire," that is, for destruction; *Ah Cun Can*, "The serpent charmer," also worshipped at Ti-Ho; *Hun Pic Tok*, "He of 8000 lances," who had a temple at Chichen Itza.

Chief of all these evil beings was the God of Death. His name is preserved in the first account we have of Yucatecan mythology, that by Father Hernandez, and, according to Father Lara, it was the same among the Tzentals, Maya, *Ah-puch*, Tzentel, *Pucugh*. These words mean "the Undoer," or "Spoiler," apparently a euphemism to avoid pronouncing a name of evil omen.¹ In modern Maya he is plain *Yum cimil*, "lord of death." He was painted as a skeleton with bare skull, and was then called *Chamay Bac*, or *Zac Chamay Bac*, "white teeth and bones."²

The spirit (*pixan*) after death was supposed to go to the Underworld, which was called *Mitna*, or *Metna* where presided the god *Xibilba* or *Xabalba*, sometimes called *Hun Ahau*, "the One lord," for to his realm must all come at last.³ Another name for this Hades was *tancucula* (perhaps *tan kukul*, "before the gods," *i. e.*, where one is judged), which is given by the *Dicc. Motul* as an "ancient word" (*vocablo antiguo*). The happy souls then passed to a realm of joy, where they spent

¹ In Maya *ppuch tun* means to stone to death, *matar à pedradas*, *Dic. Motul*.

² Beltran, *Arte de la lengua Maya*, p. 217. Another name he gives is *Ox kokol tzeek*, "thrice beaten bones."

³ Dr. Seler (*Verhand. Berlin. Anthropol. Gesell.*, 1886, S. 416) considers Hun Ahau to be a calendar name; but it is significant, without having recourse to this round-about explanation. Xibilbay, "the place of disappearance," is the Quiche name for the underworld, corresponding to the Mictlan of the Nahuas. Both the terms in the text may therefore be borrowed. See my *Essays of an Americanist*, pp. 127, 143.

their time under the great green tree *Yaxche*, while those who were condemned sank down to a place of cold and hunger.

The Conflict of the Gods.—Between these two classes of deities—those who make for good and those who make for evil in the life of man—there is, both in the myths and in the picture writings, an eternal conflict.



FIG. 8.—The gods of Life and of Growth plant the tree. Death breaks it in twain.
(Photographed from the Cortesian Codex.)

In the Codex Troano, as Dr. Seler remarks, "The god of death appears as the inevitable foil of the god of light and heaven. In whatever action the latter is depicted, the god of death is imitating it, but in such a manner that with him all turns to nought and emptiness. Where the light-god holds the string, in the hands of the death-god it is torn asunder; where the former offers incense, the latter carries the sign of 'fire' wherewith to consume it; where the former presents the sign *kan*, food, the latter lifts an empty vase bearing the signs of drought and death."

2. *The Cosmogony of the Mayas.*

We know practically nothing of the cosmogony of the Mayas; but it is instructive in connection with their calendar system to find that, like the Nahuas, they believed in Epochs of the Universe, at the close of each of which there was a general destruction of both gods and men. The early writer, Aguilar, says that he learned from the native books themselves that they recorded three such periodical cataclysms. The first was called *Mayacimil*, "general death;" the second, *Oc na kuchil*, "the ravens enter the houses," that is, the inhabitants were all dead; and the third, *Hun yccil*, a "universal deluge, a term which the *Dicc. Motul* seems to explain by mentioning a tradition that the water was so high "that its surface was within the distance of one stalk of maguey from the sky!" Another term for this catastrophe was *bulcabal*, *haycabal* or *haycabil* (destruccion, asolamiento y diluvio general con que fué destruido y asolado el mundo. *Dicc. Motul*).

This would make the present the fourth age of the world (not the fifth, as the Nahuas believed); and this corresponds to the prophecies contained in the "Books of Chilán Balam," which I have quoted in another work. The scene of the creation of man, the "terrestrial Paradise," was known as *hun anhil*, and the name of the first man was *Anum*, both apparently from the verb *anhel*, to stand erect.

Many of the high calculations of the priests must have been for the purpose of discovering the length of the present epoch and how soon the world would end. They seem to have thought this would take place when all their various time-measures would merge together into a common unity, which each could divide without remainder.¹

¹ There are some reasons to believe that at the time of the composition of the Cod. Dres. the priests calculated that the world had then been in existence 3744 years. See Förstemann, in *Compte-Rendu du Congrès des Américanistes*, VII Session, p. 746. Elsewhere, however, another suggestion as to the meaning of that number is offered.

3. *Cosmical Conceptions of the Mayas.*

The cosmical conceptions of the ancient Mayas have not hitherto been understood ; but by a study of existing documents I believe they can be correctly explained in outline.



FIG. 9.—The Universe. (From the Chilan Balam of Mani.)

One of these is the central design in the Chilan Balam, or Sacred Book, of Mani (Fig. 9). It was copied by Father Cogoludo in 1640, and inserted in his History of Yucatan, with a totally false interpretation which the natives designedly gave him.

The lettering in the above figure is by the late Dr. C. H. Berendt, and was obtained by him from other books of Chilán Balam, and native sources. In Cogolludo's work, this design is surrounded by thirteen heads which signify the thirteen *ahau katuns*, or greater cycles of years, as I have explained elsewhere.¹ The number thirteen in American mythology symbolizes the thirteen possible directions of space.² The border, therefore, expresses the totality of Space and Time; and the design itself symbolizes Life within Space and Time. This is shown as follows: At the bottom of the field lies a cubical block, which represents the earth, always conceived of this shape in Mayan mythology.³ It bears, however, not the lettering, *lum*, the Earth, as we might expect, but, significantly, *tem*, the Altar. The Earth is the great altar of the Gods, and the offering upon it is Life.

Above the earth-cube, supported on four legs which rest upon the four quarters of the mundane plane, is the celestial vase, *cum*, which contains the heavenly waters, the rains and showers, on which depends the life of vegetation, and therefore that of the animal world as well. Above it hang the heavy rain clouds, *nuyal*, ready to fill it; within it grows the *yax che*, the Tree of Life, spreading its branches far upward, on their extremities the flowers or fruit of life, the soul or immortal principle of man, called *ol* or *yol*.⁴

Turning now to the central design of what has been called the "Tableau of the Bacabs," in the Codex Cortesianus, Fig. 10, we can readily see in the light of the above explanation that its

¹ See my *Essays of an Americanist*, p. 269; and also an article by me, "Notes on the Codex Troano and Maya Chronology," in the *American Naturalist*, September, 1881.

² See the interesting observations of Mr. F. H. Cushing in my *Native Calendar of Central America and Mexico*, p. 8.

³ Thus in the *Popol Vuh*, pp. 4, 6, it is called "the quadrated earth, four-pointed, four-sided, four-bordered."

⁴ "OL; el corazon formal y no el material." *Dic. Motul*.

lesson is the same. The design is surrounded by the signs of the twenty days, beyond which the field (not shown in this cut) is apportioned to the four cardinal points and the deities and time-cycles connected with them.



FIG. 10.—Our First Parents. (From the Cortesian Codex.)

Again it is Life within Space and Time which the artist presents. The earth is not represented; but we readily recognize in conventionalized form the great Tree of Life, across it the celestial Vase, and above it the cloud-masses. On the right sits Cuculcan, on the left Xucane, the divine pair called in the *Popol Vuh* "the Creator and the Former, Grandfather and Grand-

mother of the race, who give Life, who give Reproduction."¹ In his right hand Cuculcan holds three glyphs, each containing the sign of Life, *ik*. Xmucane has before her one with the sign of union (sexual); above it, one containing the life-sign (product of union); and these are surmounted by the head of a fish, symbolizing the fructifying and motherly waters.

The total extension of the field in these designs resembles the glyph *a* in Fig. 6. It is found in both Mayan and Mexican MSS.,² and expresses the conception these peoples had of the Universe. Hence I give it the name of the "cosmic sign."

4. *Pictorial Representations of Divinities.*

Turning to the Codices and the monuments with the above mythological lore in one's memory, it seems to me there is no difficulty in identifying most of the pictures presented by them. That this has not been accomplished heretofore, I attribute to the neglect of the myths by previous writers, and a persistent desire to discover in the mythology of the Mayas, not the divinities which they themselves worshipped, but those of some other nation, as the Nahuas, Quiches, Zapotecs, or Pueblo dwellers.³ I shall pay small attention to such analogies, as the Mayas had a religion of their own, and it is that which I wish to define. We may turn first to the—

¹ "E alom, e qaholom." *Popol Vuh*, p. 6. Ximenes adds: "y mas en los nacimientos de los niños son los que asisten." *Origen de los Indios*, p. 158.

² See numerous examples in Prof. Cyrus Thomas's suggestive monograph, "Notes on certain Maya and Mexican Manuscripts," in the third annual *Report* of the Bureau of Ethnology (Washington, 1884). Mr. Francis Parry, in an article entitled "The Sacred Symbols and Numbers of Aboriginal America," in *Bull. of the Amer. Geog. Soc.*, 1894, classes it as a "sun symbol;" but in this, as in most of his identifications, I find myself unable to agree with him.

³ The doubts expressed by Dr. Schellhas as to the worth of mythology in these studies (*Zeitschrift für Ethnologie*, 1892, p. 102), are justified by the confusion of Mayan, with Mexican myths in Dr. Seler's writings; but I hope to show not by the facts themselves.

Representations of Itzamna.—I have no hesitation in identifying Itzamna with the "god B," as catalogued by Dr. Schellhas in his excellent study of the divinities of the Codices,¹ and which he believes to be Cuculcan, while the Abbé Brasseur, followed by Dr. Seler, argue, that it is a "Tlaloc" or Chac, *i.e.*, a rain god.² He is extremely prominent in the Codices, being painted in the Dresden Codex alone not less than 130 times, and in the others about 70 times. No other deity has half so many representations, and we may well believe, therefore, that he was the Jove of their Pantheon.



FIG. 11.—Monogram of Itzamna.

This at once suggests Itzamna; but a phrase of the historian Cogolludo leaves no doubt about it. The "god B" is associated with the signs of the east, and his especial and invariable characteristic are two long, serpent-like teeth, which project from his mouth, one in front, the other to the side and backward.³ These traits enable us to identify "B" with Lakin Chan, "the serpent of the east," who was portrayed "with strangely deformed teeth," and this was unquestionably but another name for Itzamna, the god of the east.⁴

An abundance of evidence may be adduced to confirm this opinion. This deity is represented in close relations with the serpent, holding it in his hand, sitting upon it, even swallowed by it, or emerging from its throat. As a

¹ Schellhas, "Die Göttergestalten der Mayahandschriften," in *Zeitschrift für Ethnologie*, 1892. This is a classical article which I shall have frequent occasion to quote.

² Brasseur, *Le MS. Troano*, p. 214.

³ Without pausing to discuss whether this is "tooth" or "tongue," it is, at any rate, a serpentine trait, as may readily be seen by comparison with many serpents pictured in the Codices. I may add that Professor Cyrus Thomas writes me that he also considers the "long-nosed god" to be Itzamna.

⁴ The phrase of Cogolludo is: "con dientes muy disformes." The name *Lakin Chan*, is in the Tzental dialect. The Maya would be *Likin can*; though *lakin*, east, appears in the "Books of Chilán Balam."

"medicine man" he carries the "medicine bag," and the wand or baton, called in Maya *caluac*, "the perforated stick,"¹ surmounted with a hand, hinting at his name above given, *Kabil*, the Skilful Hand. He is often in a boat, to recall his advent over the eastern sea, and he is frequently associated with the

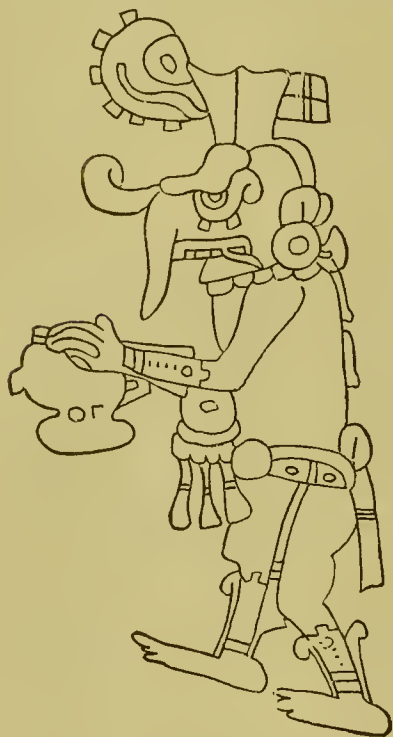


FIG. 12.—Itzamna: from the Codex Troano.



FIG. 13.—Itzamna: from the Inscription of Kabah.

showers, as was Itzamna, who said of himself, *its' en muyal, its' en caan*, "I am what trickles from the clouds, from the sky." As the rising sun which dispels the darkness, or else as the physician who heals disease, he is portrayed sitting on the head of the owl, the bird of night and sickness; and as the giver of

¹ *Caluac* is from *calacal*, "cosa muy agujerada" (*Dicc. Motul*). The mayordomo was called *ah caluac*, the baton being his staff of office. Landa omits the prefix by mistake, *Rel. de Yucatan*, p. 40. It is well shown on a later page.

life he is associated with the emblem of the snail, typical of birth.

He himself is never connected with the symbols of death or misfortune, but always with those of life and light. The lance and tomahawk which he often carries are to drive away the spirits of evil.

Besides the above peculiarities, he is portrayed as an elderly man, his nose is long and curved downward, his eye is always the "ornamented eye," which in the Maya Codices indicates a divinity. He is associated with all four quarters of the globe, for the East defines the cardinal points; and what is especially interesting, it is he who is connected with the Maya "Tree of Life," the celebrated symbol of the cross, found on so many ancient monuments of this people and which has excited so much comment. This I shall consider later.



FIG. 14.—Itzamna: from the Dresden Codex.

We know from the mythology that Itzamna, like most deities, was multiform, appearing in various incarnations. In the ceremonies this was represented by masks; with this in mind I class as merely one of the forms or epiphanies of Itzamna that figure

in the Codices described by Dr. Schellhas as a separate deity, "the god with the ornamental nose," whom he catalogues as "god K." I am led to this conclusion by a careful study of all



FIG. 15.—Mask of Itzamna (?).

the pictographs in which this deity appears; they all seem to show that it is Itzamna wearing a mask to indicate some one manifestation of his power (see especially Cod. Dresden., pp. 7, 12, 25, 26, and 34, 65, and 67, where Itzamna

is carrying the mask on his head). That there is a particular monogram for this character merely indicates that it was a separate mythological manifestation, not a different deity.

A remarkable and constant feature in the representations of Itzamna is his *nose*. Thomas calls it "elephantine," but, as Waldeck and Seler have shown, it is undoubtedly intended to imitate the snout of the *tapir*.¹

When we remember that this animal was sacred to Votan, who played the same part in Chiapas that Itzamna did in Yucatan, dividing and naming the land, etc.; and that the interesting slate tablets from Chiapas, in the National Museum of Mexico, portray the sacred tapir in intimate connection with the symbol of *the hand*,² that associated with Itzamna,—we are led to identify the two mythical personages as one and the same. According to Bishop Landa the tapir was not found in Yucatan except on the western shore near the bay of Campeche,³ which shows

¹ Waldeck, *Voyage Pittoresque dans l'Yucatan*, pp. 37, 74, etc. (Paris, 1838.) This writer recognized the tapir snout on various masks and statues at Palenque, and adds that he found the animal still venerated by the natives. Dr. Seler does not mention Waldeck's remarks, but extends the identification to the figures in the codices. *Zeitschrift für Ethnologie*, 1888.

² On the symbolism of the tapir see the erudite remarks of Don Alfredo Chavero in the *Antigüedades Mexicanas publicadas por la Junta Colombina de Mexico*,—*Texto*, p. xxxv (Mexico, 1892).

³ *Relacion de las Cosas de Yucatan*, p. 109 (Madrid Edition).

that the myth of the tapir god was imported from Tzentel territory.

It may be asked why the tapir, a dull animal, loving swamps and dark recesses of the forests, should have been chosen to represent a divinity of light. I reply, that it arose from the "ikonomatic" method of writing. The word for tapir in Maya is *tzimin*, in Tzentel *tsemen*, and from the similarity of this sound to *i-tzam-na* the animal came to be selected as his symbol. No such sacredness attached to the brute among the Quiches, for in their tongue the allusive sound did not exist, the tapir being called *tixl*. This rebus also confirms the identity of Itzamna with the tapir-nosed deity of the Codices.¹

The annual festival to Itzamna was called *Pocam*, "the cleansing." On that occasion the priests, arrayed in all their insignia, assembled in the house of their prince. First, they invoked Itzamna as the founder of their order and burned to him incense with fire newly made from the friction of sticks. Next they spread out upon a table covered with green leaves the sacred books, and asperged their pages with water drawn from a spring of which no woman had ever tasted. This was the ceremonial "cleansing." Then the chief priest arose and declared the prognostics for the coming year as written in the holy records.²

We may well believe that the Dresden Codex, pages 29-43, which are entirely taken up with the deeds and ceremonies of Itzamna, was one of the books spread out on this solemn occasion.

Representations of Cuculcan.—As I believe the reasons above given are sufficient to establish the identity of the "god B,"

¹ In the *American Anthropologist*, July, 1894, Mr. J. Walter Fewkes devotes an article to what he calls "the long-nosed god" in the Cortesian Codex (Itzamna). He does not mention the similarity of the nose to the snout of the tapir, and his conclusion is that it is a "snake rain god," "probably Cuculcan," "parallel with Tlaloc." He thinks the heads portrayed in the Codices are "masks or ceremonial helmets." It is needless to point out the divergence between his opinions and mine on these points.

² Landa: *Relacion de las Cosas de Yucatan*, p. 87.

of Dr. Schellhas' catalogue, with Itzamna, so I think his "god D" is Cuculcan.¹ He himself believes it to be a "night god," or a "moon god," while Dr. Seler considers it to portray Itzamna.

The characteristics of this divinity are: A face of an old man, with sunken mouth and toothless jaws, except one tooth in the lower jaw, which, in the Tro. and Cortes. Codices, is exaggerated as a distinctive sign; he has the "ornamented eye" peculiar to deities; and to his forehead is attached, or over it hangs, an affix, which generally bears the sign *akbal*, which means "darkness," because he is the setting or night

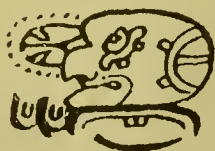


FIG. 16.—Monogram of Cuculcan.



FIG. 17.—Cuculcan, with owl head-dress.

sun; for which reason his head-dress is often the horns of the eared owl. He is clearly a beneficent deity, and is never associated with symbols of misfortune or death. Indeed, he is at times evidently a god of birth, being accompanied with the symbol of the snail, above explained, and is sometimes associated with women apparently as an obstetrician. He is connected with serpent emblems, and holds in his hand a sacred rattle formed of the rattles of the rattlesnake.

All these traits coincide with the myths of Cuculcan; but when we perceive that he, and he alone of all the deities, is

¹ The name has various orthographies; that which I here adopt appears to have most in its favor. It is a compound of *cucul*, covered (*i. e.*, with feathers), and *can*, snake; (*cucul* also means "revolving.")

occasionally depicted *with a beard under his chin*, just as Cuculcan wore in the legend, the identification becomes complete.¹

The most striking of his representations, and that which is most distinctive of his identity with the "green-feathered serpent," is the picture which extends over pp. 4 and 5, middle, of the Dresden Codex. Here he is seen with face emerging from the mouth of the great, green-feathered snake-dragon, indicative of his own personality, his hieroglyph immediately above his head.²

Representations of Kin ich.—As has already been observed, the sun at noon, conceived as a divinity, did not occupy a prominent place in Maya mythology; and this is also the case in the pictorial designs.

There is no doubt as to his representation. It is accompanied by the well-known ideogram of the sun scattered over his body and represented above him. It will be seen on a later page.



FIG. 18.—Monogram of Kin ich.

He is richly arrayed with large ear-rings and a characteristic, prominent nose decoration. He has the "ornamented eye" and a full head dress. (God "G" of Schellhas).

Proceeding now to consider other divinities of the beneficent class, I begin with—

Representations of Xaman Ek, the Pole Star.—This is the "god C, of the ornamented face," of Dr. Schellhas' list, who suggests its identity with the pole star. The very characteristic face recurs extremely frequently, especially in Codices Troano, Cortesianus, and Peresianus. We have evidently to do with an important divinity, and, as Dr. Schellhas says, "one of the

¹ Examples are frequent; a good one is Cod. Tro., p. 24* a. Not to be confounded with the *moan* hairs around the mouth, nor with the chin beard of the black monkey.

² Space does not permit me to enter into the symbolism and myths connected with "the feathered serpent" of Central American mythology. Mr. Fewkes has argued that it also extended to the Pueblo tribes, and traces may be found still further north. See Fewkes, in *American Anthropologist*, July, 1893.

most remarkable and difficult figures in the manuscripts." That it is the personification of a star he argues, (1) from the ring of rays with which it is surrounded, Cod. Cort., p. 10; (2) from its appearance in the "constellation band;" (3) from its surmounting in certain pictures the "tree of life;" and that it is the North Star is shown by its presence in the hieroglyph of that quarter and its association with the sign for north.

There is another, and, to me, decisive argument, which at once confirms Dr. Schellhas' opinion, and explains why the north star is represented by this peculiar, decorated face.

The term for "north" in Maya is *xaman*, whence *xaman ek*, north star. The only other word in the language which at all resembles this is *xamach*, the flat, decorated plate or dish (Nahuatl, *comalli*) on which tortillas, etc., are served. In the rebus-writing the decorations on the rim of this dish were conventionally transferred to the face of the deity, so as to distinguish it by recalling the familiar utensil. For a similar reason it is also called "the shield star," *chimal ek* (like *chimal ik*, north wind); but as this is a foreign word (from the Nahuatl, *chimalli*, shield), it was doubtless later and local. I shall refer to this peculiar edging or border as the "pottery decoration," and we shall find it elsewhere.

That the figure is associated at times with all four quarters of the world, and also with the supreme number 13 (see above, p. 24), are not at all against the identification, as Dr. Schellhas seems to think, but in favor of it; for at night, all four directions are recognized by the position of the pole; and its immovable relation to the other celestial bodies seems to indicate that it belongs above the highest.

The North Star is especially spoken of as "the guide of merchants." Its representation is associated with symbols of peace and plenty (removing the contents of a tall vase, C. Cortes., p. 40; seated under a canopy, *ibid.*, p. 29). In front of his forehead is attached a small vase, the contents of which are trickling into his mouth (?).

He is especially prominent in the earlier pages of the Cod. Peres., where his presence seems to have been practically overlooked by previous writers ; and it is true that the drawings are nearly erased. Close inspection will show, however, that he is portrayed on both sides of the long column of figures which runs up the middle of page 3. On the left, he is seated on the "Tree of Life," as in Cod. Troanus, p. 17, *a* (which is growing from the vase of the rains, precisely as in Cod. Tro., 14, *b*, where the star-god is sailing in the vase itself). On the right of the column he is shown in the darkness of night (on a black background), holding in his hand the *kan* symbol of fortune and food. A similar contrast is on page 7, where on the right of the column he is seen above the fish, and on the left, in the dark, again with the *kan* symbol. On the intermediate page he is seated opposite the figure of Kin ich Ahau, which is head downward, signifying that when the sun is absent the pole star rules the sky.



FIG. 19.—The North Star God.

Representations of the Planet Venus.—In view of the prominent part which the Venus-year plays in the calculations of the Codices, it has surprised students that no pictorial figures of this bright star appear on their pages. On this point I have some suggestions to make.

In one part of the Codex Troano (pp. 1*–10*) there are a great many—nearly fifty—pictures of an insect resembling a bee in descending flight. These pages have been explained by

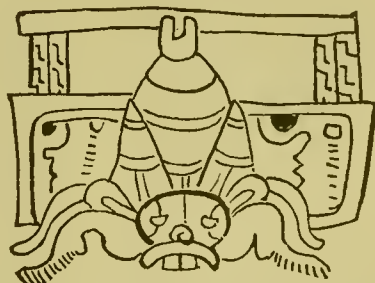


FIG. 20.—The Bee god. (Codex Troano.)

Thomas as relating to apiculture and the festivals of the bee-keepers, and by Seler, who rejects that rendering, as referring generally to the descent of deities to receive offerings. Direction downward is indicated not only by the position of the insect, but by the accompanying hiero-

glyph, which reads *caban*, the first syllable of which, *cab*, means "downward." My suggestion is that in this bee-like insect we have an ikonomatic allusion to the Evening Star, which, as I have already stated, was sometimes called *xux ek*, "the bee or wasp star."¹

Not only is the picture phonetically appropriate, and the "sign" consistent, but that a deity is referred to is shown by three anthropomorphic pictures of the bee (two on p. 4* and one on p. 5*). Furthermore, the "sign" or monogram of the bee deity (Fig. 20) appears on the so-called "title pages" of the Cod. Tro. and Cod. Cortes., adjacent to that of the north star, indicating that another stellar deity is represented.

The object toward which the insect descends is generally either a fire, or that shown in Fig. 22.² This was supposed by Brasseur to be a honeycomb, and by Seler, a food offering. It is almost precisely the conventional representation of the clouds, as may be noted in the interesting scene on Cod. Tro., p. 5*, where this object is placed upon the earth, below which is the cloud symbol. Often it is yellowish, a point which has been urged in proof that it is honey. Does it not mean the golden-hued clouds of sunset, and the fire, the flame of the setting sun, into which the Evening Star descends?

The sign *caban*, "downward," naturally refers to the Earth.³ Thither sinks the star of evening to join the departed orb of day; hence this star mythically becomes the Earth-goddess, the associate of the setting sun. Cuculcan is very frequently depicted in relation to an old crone, having, like himself, but one

¹ Father Lara, in his *Vocabulario Tzental*, MS., gives the name of one variety of bee as *xanab xux*; in Maya, *xux* is usually translated "wasp," "abispa brava." As a radical, it seems to mean "to go or sink slowly into something."

² The two bees, one waking, one sleeping, Cod. Tro. 33*, are placed between signs representing the winds.

³ The word *cab* has various meanings: a bee; a bee-hive; honey; the red or white clay with which potters painted their jars; strength or power; town, place, or world; short or low; down, downward, or below (all given in the *Dicc. de Motul*).

tooth, and, like himself, ever engaged in kindly offices, good to men. She, I take it, is the Evening Star in her epiphany as Mother Earth, source of life, ancestress of the race.

A striking verbal analogy supports this. In the *Popol Vuh*, the sacred book of the Quiches, the "feathered serpent," Gukumatz, is positively said to be the bisexual principle of life represented by the male Xpiyacoc and the female Xmucane, ancestor and ancestress of all that is.¹ Here, *x-mucane* is most likely the Quiche feminine form of *muc* (*ul*) *canan*, which is a Tzentan name

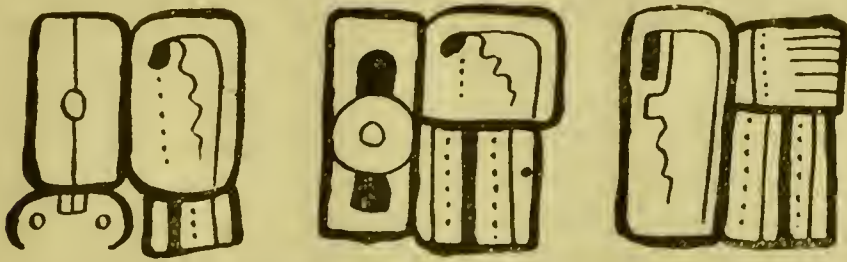


FIG. 21.—Monograms of the Bee God.

for the planet Venus, as I have already mentioned.² My conclusion is, therefore, that the old woman so frequently associated with Cuculcan is the Evening Star, in her form as the Earth-Goddess. I shall recur to her on a later page.

I think all these representations of the bee should be interpreted as indicating the movements of Venus, and the mythical conceptions with which they were connected in the native mind.



FIG. 22.—Offerings to the Bee God.

¹ "Thus it is that are named, sung, and celebrated those who are the grandmother and grandfather, whose name is Xpiyacoc, Xmucane, preserver, protector, twofold grandmother, twofold grandfather. * * * They alone, the Maker, the Former, the Ruler, the Serpent clothed in feathers, They who beget, They who impart life, They rest upon the waters like a growing light. They are clothed in color green and blue. Therefore their name is *Gucumatz*, 'Feathered Serpent.'" *Popol Vuh*, pp. 4, 6.

² The root *muc*, in all the Mayan dialects, also means "to cover over, to hide, to bury." The word *mucul* ("that which is disappearing") is applied to the moon when in the wane (*luna menguante*).

Representation of Ghanan, God of Growth and Fertility.—Bishop Nuñez de la Vega tells us that in the calendar he discovered among the natives of his diocese, the fourth "sign" or day corresponded to the Mexican Centeotl, god of fertility and the maize harvests. This fourth day in the Tzental calendar bore the name *Ghanan*, and on turning to the Tzental Dictionary prepared by Father Lara, we find that *ghan* is the general term for the ear of maize; *aghan*, when the grains are still soft.

His representations in the Codices are moderately frequent and quite peculiar. They all present in a marked degree the flattening of the forehead and prolongation of the occiput upward which is so striking in many of the sculptures.

Dr. Schellhas, indeed (who catalogues him as "God E"), is so impressed by this that he argues that all such forms were imaginary, obtained by the artists through copying the conventional drawings of an ear of maize arranged as a head-dress.

This, however, is going too far, as there is evidence, derived from ancient skulls, that certain classes of Maya priests used to have the head artificially flattened in this manner.¹ Perhaps they were those destined for the service of this or similar deities. The officiants on the Palenque "Tablet of the Cross," presenting offerings to the "tree of life," are both deformed in this manner.



FIG. 23. — From the Head-dress of the God of Growth.

The maize god is associated with symbols of food, of vegetable growth, and of prosperity. He carries a vase or is drawing forth the contents of one, Cod. Cort., p. 40; he is seen with the loom, Cod. Dres., p. 45, and he generally has about him the *kan* symbol, that of means and comfort.

¹ See Crescencio Carrillo, in *Anales del Museo Nacional de Mexico*, Tomo III, and Dr. Boas, in *Proceedings of the American Antiquarian Society* for 1890, pp. 350-357; the *Dic. Motul* gives the Maya word for one with head thus flattened, "*pechhec hol, el de cabeza chata.*" Landa, *Cosas de Yucatan*, cap. XXX, speaks of the custom.

Representations of the Serpent Goddess.—One of the most striking pictures in the Codices is the Serpent Goddess, whose familiar is the rattlesnake, which she wears as a head-dress or as a girdle. She is depicted as an old woman, her costume ample and often splendid, decorated with embroidery and bells, with necklace and ear-rings of jade.

In expression she is severe, her lips protrude in anger, and her hands and feet sometimes end in claws. The sinister cross-bones sometimes decorate her skirts. Her business is with water and the rains. She is pouring from a vase (*Cod. Dres.*, pp. 43, 67, 74); or water is flowing from her armpits, hands, and mammæ; or she is ejecting it forcibly from her mouth (*Cod. Tro.*, pp. 25, 27, 34*).

She is, however, not always represented as in old age, or else there was another serpent goddess in the mythology; for in a number of places a similar serpentine head-dress is borne by a young woman who holds a vase containing the rattles of the rattlesnake (*Cod. Dres.*, pp. 15, 18); or (*ibid.*, p. 20), a figure which shows seven black dots. May this be a sign of the constellation of the Pleiades, which in the Maya language bore the same name as the rattles of the rattlesnake, *tzab*?

As to the signification of the serpent goddess, I think there can be no question of it, from a study of her appearance, signs, and associations. She was the *personification of the thunder-storm*. The vase she empties is the descending torrent of rain, the rattles she carries are the thunderclaps, her severe mien is the terror inspired by the din of the elements. In Maya, the word for "thunder," *pecchac*, is derived from the noun *pec*, which means "a sound like that of a bell or rattle" (*Dicc. Motul*).

Representations of Xmucane.—A third goddess who can be clearly distinguished is one with features of an old woman, her face wrinkled, her mouth sunken, and but one tooth left in her lower jaw. She usually wears her hair in a peculiar style, two wisps or ends of it twisted above her head.

She does not appear in the Peresianus, and perhaps not in the

Dresden manuscript, but holds a prominent place in the Troanus and Cortesianus. Her occupations are peaceable; she is weaving on a loom (C. Tro., p. 11), carrying a plate of cakes, etc. (Cod. Cortes., pp. 10, 11).

In appearance she is the female counterpart of Cuculcan, and is plainly intended to represent his companion or wife. In the "Tableau des Bacabs" of the Codex Cortes., these two alone are represented sitting under the central "tree of life," where they are placed back to back (see above, p. 49); while in the section of the tableau showing the West, they are placed face to face, she seated under a canopy hung with black and red dotted lines.

In her, therefore, we have a person of great importance, the consort of Cuculcan, intimately associated with the quarter of the West to which he belongs. Dr. Seler has argued that she was the goddess Ix chel, and the personification of the Earth. With the last supposition I agree, but not with the name. Ix chel was distinctly by name and myth the goddess of the rainbow. Much more probably we have in this ancient crone, as I have already said, the personification of the Evening Star, and the Earth, Xmucane, the companion of the sun when worn out by his day's work, whose home is with him in the West, and whom she soon joins.

Representation of Ah-Puch, God of Death.—Next to Itzamna, god of Life, the god of Death, Ah-Puch, is represented most frequently on both Codices and monuments. In the former his picture is given about eighty times, usually as a skeleton with tremendous jaws, always with fleshless skull and backbone,—a true "God Barebones," as the *Dicc. de Motul* describes him.

His symbols are unmistakeable,—the head of a corpse and cross-bones, the ill-omened owl and the ravenous dog,—wonderfully "European" indeed. He has numerous costumes and head dresses, some quite fanciful, and occasionally bells are attached to his ankles and clothing. Some of his delineations seem

to reveal a sense of ghastly humor, as we see in the medieval "dance of death."

He is associated with the north, because in that direction lay the mythical home of departed souls; but he is also present in the other quarters of the compass, for death knows no distinction of places or persons. Besides the cross-bones, usually



FIG. 24.—The God of Death. (From the Codices.)

shown as in Fig. 25, No. 1, he often bears the curious design No. 2,¹ which I take to be a *maggot*, and his head-dress is sometimes as No. 3, decorated with teeth, or flints, with rays.

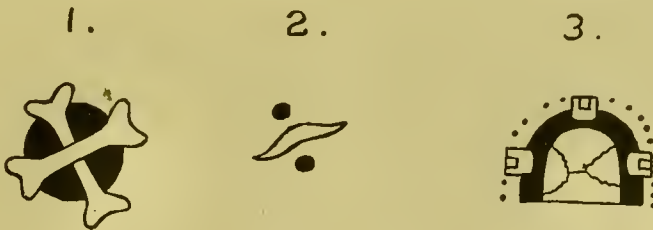


FIG. 25.—Symbols of the God of Death.

Representation of the God of War.—Frequently associated with the figure of death is that of a deity with a black line across his face. This is numbered by Dr. Schellhas the "god F,"

¹ Former students have been unable to explain this design. It is also found in Mexican pictography, as Cod. Vien., pp. 20, 22.

and called by him a "god of death." Much has been made of the line across his face as identifying him with the Mexican god Xipe, "the flayer;" but this is not a constant mark of Xipe, as Father Duran neither mentions it nor portrays it. In fact, it is nothing more than the line of black paint athwart the face which



FIG. 26.—The God of War.

meant "war" very generally among the American Indians. An inspection of the pictures clearly indicates that this is a war god. For instance, in Cod. Tr., 27 *, 28 *, 29 * c, he is shown repeatedly at full length, armed with a flaming torch in one hand and a flint knife in the other, firing the canopies of princes, his body striped with war-paint like his face, following the god of death, who goes before him beating on a drum and singing a song of war (as shown by the lines issuing from his mouth). In Cod.

Dresden., p. 6 e, he wears a war helmet with nose-piece, and his body is black-striped also.

Which of the gods of war I have named this leading one may have been, I leave undetermined.

Representations of Ek Ahau and Other Black Gods.—In the Codices there are about fifty figures painted black, evidently intended to represent deities supposed to be thus colored. Forty of them are in the Codex Troano, which is in parts devoted to a prominent character of this hue. He is depicted with a truculent expression, a reddish-brown band around his mouth, and with a large, hanging under-lip. He is generally armed and often fighting. His figure is sometimes drawn unusually large, of a ferocious appearance, and carrying a huge spear, a shield, a tomahawk, a lighted torch, or other fearful sign of war. (See Cod. Tro., pp. 24, 25.)

Previous writers have not been able to assign a name to this deity. Prof. Thomas suggested that it was Ek Chual, said

by Landa to be the god of the cacao planters; but to this, Schellhas objects that his warlike traits exclude such a supposition.¹ So the latter refers to him merely as "the god M."

About his name, however, there can be no doubt. The paintings correspond precisely with what Nuñez de la Vega tells us of the Tzentel divinity. *Ical Ahau*, Maya, *Ek Ahau*, names which he translates, "the black chief," or, "the king of the blacks." He was reported to have been "a famous warrior and most cruel." He was depicted "in the figure of a ferocious blackamoor with the members of a man."² The "blacks" of whom he was king were seven in number, and were painted in most of the native calendars which the bishop found among the Tzents. They were the signs of seven days, beginning, he adds, with Friday, which may have been an erroneous explanation of the "masters."

Among the remainder of the seven were doubtless the god *Ek Chuah*, of the cacao planters, and the god "L" of Dr. Schellhas' list. The latter is found in the Cod. Dresden., pp. 7, 14, 21, 24, 46; but not at all in the Troanus. It is evident, however, that, as Dr. Schellhas observes, several minor black gods are

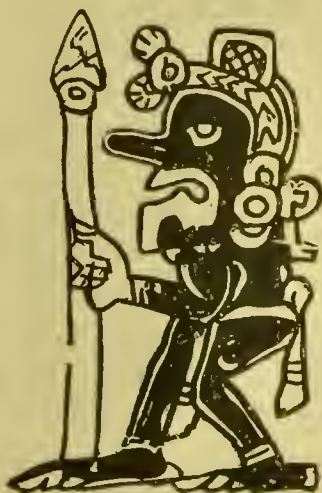


FIG. 27.—Ek Ahau, the Black Captain.

¹ In Cod. Tro., p. 29*, et seq., the black god has a girdle, to which are attached the leg and claw of a scorpion. The name of the large black scorpion in Maya is *ek chuh*, literally "the black scorcher." Dr. Seler appositely suggests that this may be a rebus for the name of the god.

² "En figura de feroz negro, como una imagen de escultura, con los miembros de hombre. * * * Fué gran guerrador y crudelissimo. * * * Quiere decir negro principal, ó Señor de los negros." Nuñez de la Vega: *Constituciones Diocesanas*, p. 9; *Carta Pastoral*, IX. (Rome, 1702.)

depicted, which is explained by the statement of the Bishop of Chiapas, that there were seven of them.¹

5. *The Maya Priesthood.*

Not all the designs of the inscriptions and Codices are to be considered deities, however. Doubtless the priests, their representatives, also appear. These were numerous and of both sexes, called respectively, *ah-kin* and *ix-kin*, masters of days and mistresses of days, that is, having power to predict auspicious and inauspicious days. The chief priest was variously called *ah-kin mai* and *ahau can mai*, the word *mai*, dust, fragrance, vapor, referring to the sacred rite of blowing substances through a tube in incantation, as we find often represented in the Codices.² *Ahau can*, which at times means "rattlesnake," should perhaps here be translated, "master of words," as another term for the high priest was *ah-chun can*, which is rendered "one who has the right of the first speech in business; also, high priest." (*Dicc. Motul.*)

They were divided into a number of classes exercising special functions; as the *ah-mac ik*, who conjured the winds; the *ah-uai chac*, who could bring rains; the *ah-pul*, "fetchers," who could cause sickness, induce sleep, etc.; the *ah-uai xibalba*, who made a specialty of interviewing departed spirits; the *ah-cunal than*, who conjured by magical words; and others.³

In their rites they were accustomed to appear in masks,

¹ "En muchos pueblos de las provincias de este obispado tienen pintados en sus Repertorios ó Calendarios siete negritos para hacer divinaciones y prognosticos correspondientes à los siete dias de la semana, comenzandola por el viernes à contar." Nuñez de la Vega: *Constituciones Diocesanas*, p. 9.

² I add the following definitions: "MAI, polvillo que sale del tabaco, etc., cuando le tratan con las manos. MAAY, espuma del palo que se quema. BOLON MAYEL, cualquier olor suavissimo y transcendente." *Bolon*, nine, in the last word is used in Maya as an expression of admiration. (See p. 25.) The term is from Landa, *Cosas de Yucatan*, c. 7.

³ Among feminine forms I find *ix-boual*, prophetess; *ix-cunal than*, conjurers.

koh, and dressed in skins of wild animals, as tigers, etc.¹ Their ceremonies were often painful, as the old writers report, and as the words to express them, *kup*, to cut, *ppeta*, to cry out with pain, testify. This is also abundantly shown by the pictures of scarifying the body and transfixion of the tongue and ears, on the monuments.

They are said to have worn their hair uncombed and long, often matted with the blood of the sacrifices. The expression for this was *hunhun buclah u tzotzel hol*, (el que trae largos revueltos y marañados los cabellos como los traen los idolatras. *Dicc. Motul*).



FIG. 28.—A Maya Priestess, bearing the *Moan Bird*. (From the Dresden Codex.)

6. *Fanciful Analogies.*

It were easy in these names, myths, and pictures, to pick out abundant analogies to the mythologies of Peru and Mexico, of the Pueblos and of the Old World. It has been done over and over again, usually with a total oversight of the only point in which such analogies have much value—the similarity disclosed the world over by independent evolutions of the religious sentiment. The effort by such resemblances to prove identity of historical origin is to be deprecated whenever the natural growth of myths and rites will explain the facts considered. For that reason I shall say nothing about “Tlaloc deities,” “serpent gods,” etc., with which so many pages of other writers have been fruitlessly taken up. That the adjacent nations of equal culture influenced the people of Yucatan to some extent, was no doubt a fact. It could not have been otherwise. But that the Mayan mythology and civilization were distinctly inde-

¹ The *Dicc. Motul* gives: *Ah-koh keuel*, for the wizard wearing a mask and clothed in the skin of the jaguar.

pendent, and were only superficially touched by their neighbors, I am deeply convinced.

On the other hand, just how far the influence of this potent and personal culture of the Mayas extended, it is difficult to delimit. I have found no trace of its peculiar forms in South America, nor anywhere in North America, beyond the boundaries within which that extraordinary calendar was accepted, upon which so much of it was based; but this, as I have shown elsewhere, included not less than seven entirely different linguistic stocks.¹

7. *Total Number of Representations.*

The actual progress toward an analysis of the pictorial elements of the Codices which the above identifications indicate, may best be shown by a few statistics.

I find that the total number of figures of men and women, or of anthropomorphic deities, which are preserved in the manuscripts, is just about 950, of which 825 are males and 125 are females.

They are distributed as follows:—

Codex Peresianus,	40 males	no females
Codex Cortesianus,	157 “	6 “
Codex Troanus,	345 “	47 “
Codex Dresdensis,	283 “	72 “
	<hr/> 825	<hr/> 125

Confining our attention to the male deities, the attributes of which have been above described, we find their pictures are distributed as follows:—²

¹ See *The Native Calendar of Central America and Mexico*, p. 5.

² My count does not agree entirely with that of other observers (Fewkes, Schellhas). I have limited my identifications to such figures as seemed to me beyond reasonable doubt.

	PERESIANUS.	CORTESIANUS.*	TROANUS.	DRESDENSIS.
Itzamna,	4	30	32	130
Cuculcan,	22	54	20
Kin Ich,	4	2	8	22
Xaman Ek,	7	20	20	5
The God of Maize,	16	60	6
Ah Puch,	2	21	25	29
The God of War, . . .	9	3	26	13
The Black Gods, . . .	2	2	39	4
Total, . . .	28	116	264	229

This gives a total of 638 figures which have been recognized; in other words, more than three-fourths of the whole number.

Of the remainder a considerable portion are unimportant men and persons, victims of sacrifice, captives, attendants, etc.; others are priests or officiants in ceremonies; allowing for which, it is certain that no prominent figure in Mayan mythology under the human form remains to be discovered in the Codices. This is a satisfactory result, and shows that, as far as their pictographs go, the contents of these once mysterious volumes are scarcely an unsolved enigma.

8. *Figures of Quadrupeds.*

The pictorial portions of the Codices contain delineations of various animals, some of which are evidently introduced with symbolical meanings, and others probably so.

The dog, Maya, *pek*, is one of the most conspicuous. It is the native breed, with smooth coat and erect ears. In many instances it is associated with the sign for night, *akbal*, and with the god of death (Cod. Tro., pp. 2, 3, 32, 33); also with the storm and the lightning. For that reason Dr. Schellhas and Dr. Seler regard him as a symbol of lightning.¹ But I am persuaded that while not disconnected with this, the dog represents pri-

¹ There may be here an ikonomatic allusion, or play on words. The word *pek*, dog, is close to *pec*, to sound, to make a noise, which was used for the thunder, as in the current phrase *pecni caan*, "the sky rang" (*sonó el cielo, Dicc. Motul*).

marily some star or constellation. At times he is dotted with spots to represent stars, Cod. Dres., p. 21; the *akbal* sign refers to the night. His body is often in human form, carrying a torch in each hand, Cod. Dres., p. 39. (Compare Cod. Tro., p. 23*.) In Cod. Dres., p. 40, he falls from the sky; and in *ibid.*, p. 47, he is slain by the shaft of Itzamna. (Compare *id.* 2, where Itzamna is sitting upon him.) He plays on the medicine drum, Cod. Tro., p. 20, and is associated with the rains, *id.* pp. 26, 27. He represents the end and beginning of time-periods, Cod. Cort., p. 32.

The spotted leopard, the jaguar, Maya, *balam*, whose name is attached to the Chacs, and which appears in the calendar and in many of the myths of the Mayan stock, is represented in a number of passages of the Codices, as Cod. Dres., pp. 8, 26; Cod. Tro., pp. 17, 20, 21, 22. In one part, Cod. Tro., 14, he enters dressed as a warrior with a human body.

The monkey, *maax*, is not often depicted, but is found with astronomic relations, Cod. Tro., 25*; his sign is distinguishable by the markedly prognathic jaws.

Deer are numerous, especially in the Cod. Troanus, where the pages 9-12 are occupied with a series of pictures of the animal in snares. On page 14 a large one is shown, sitting on his rump, his organ erect and prominent. I have little doubt these represent a constellation. In Cod. Dres., p. 2, a composite figure with deer's hoofs appears three times, sailing through the sky on the serpent's head. (Compare Cod. Cort., p. 14.)

The small edentate, the nine-banded armadillo, *Tatusia novemcincta*, in Maya, *ibach*, is shown twice in the Cod. Tro., both times caught under a trap, once, p. 9, under the wind sign, again, p. 22*, under the *cauac* sign. What it represents is unknown.

9. Figures of Birds.

Birds had important symbolical functions, and a number are figured in the Codices. In their identification I have had the advantage of the advice of Mr. Witmer Stone, who has pursued

his ornithological studies in Yucatan itself. The following are recognizable :—

1. The red macaw, *Ara macao*, Maya, *moo* or *ahlo*; the type is shown in Fig. 29. This was the symbol of Kin ich.



FIG. 29.—Bird Symbols from the Codices.

2. The horned or eared owl, a large raptorial bird of the genus *Bubo*, Maya, *cos*.¹ He is usually shown in full face to display his ears or horns, *e. g.*, Cod. Tro., 18*. He appears as an associate of the gods of death and war, and symbolizes clouds, darkness, and inauspicious events. His horns frequently appear on the head-dress of Cuculcan to indicate the departing sun and night, like the *akbal* sign. (See Cod. Tro., pp. 19, 29*, 35*.) He is often associated with the number 13, and may represent in the calendar the 13-day period.

3. Two species of vulture, the king vulture, *Vultur papa*, and the turkey vulture, *Cathartes aura*, both abundant in Yucatan, Maya, *kuch* and *ahchom*. The former is the bird seated on the "tree of life," tearing out the eyes of the victim, Cod. Dres., p. 3; Cod. Tro., pp. 15, 17, or the entrails, Cod. Tro., p. 15, 17. The naked head and neck of the vulture on a human body is seen Cod. Dres., pp. 8, 13, 19, 38; Cod. Cort., p. 10, etc. His head is his monogram, frequent in Cod. Peres., pp. 4, 7, 9, etc. (See Fig. 29, No 2.) Its body is sometimes black, at others more or less white.

4. The quetzal bird, *Trogon splendens*, is distinctly shown in Cod. Dres., p. 16, above the middle figure.

¹ In Spanish, *bujarro*. The *Dicc. Motul* says of it, *sub voce*, *cos*, "ave de rapina; coge gallinas y grita como muchachos."

5. The crested falcon, *Spizætus tyrannus*, the *moan* bird, in Maya *muan* or *muyan*. This has well-developed tufts of erectile feathers on the head and resembles in the drawings the horned owl. It is believed by Förstemann to be the symbol of the Pleiades ; by Seler, to be associated with the clouds and rains. Both are probably correct.¹ (See Fig. 28.)

6. The pelican or cormorant is drawn with a human body and the " fish and oysters " sign in Cod. Cort., pp. 20, 21.

7. Blackbirds, of which two species live in Yucatan, are portrayed in Cod. Tro., p. 31.

8. The wild turkey is easily recognized by his head and " wattle " among the food offerings.

10. *Figures of Reptiles.*

Among reptilians, the turtle or tortoise (Maya, *ac*) is one of the most prominent. By Dr. Schellhas it has also been called a *Blitzthier*, or animal symbolical of the lightning, basing his opinion especially on Cod. Dres., p. 40, where a human figure with a tortoise head is seen holding a torch in each hand. It is distinctly represented as a celestial body in Cod. Cort., pp. 13, 17, 37, and 38 ; and when we are informed that the Mayas called a portion of the constellation Gemini by the name " the tortoise," it is quite clear that we are dealing with an astronomical, not a meteorological, emblem.

Dr. Förstemann has advanced the theory that at least one and an important function of the tortoise was as a symbol of the summer solstice, in accordance with which he explains Cod. Dres., p. 40 ; and that on the earth-plane it indicated the north-east and northwest directions. His arguments for this opinion, if not conclusive, certainly attach to it a high probability.

¹ Some writers have thought that the *moan* bird was a mythical animal ; but Dr. C. H. Berendt found the name still applied to the falcon. In the form *muyan*, it is akin in sound to *muyal*, cloud, *moan*, cloudy ; which may account for its adoption as a symbol of the rains, etc.

Between the tortoise and the snail (Maya, *hub* or *ut*) there is in the Codices some mythical relation. In the Aztec symbolism the snail is often an emblem of death; but also of birth. It is likely that the same holds true of the Maya designs. The animal is associated distinctly with the beneficent deities, notably with Itzamna and Cuculcan, Cod. Dres., 5 and 37. But it is also visible in close relation with the god of death, Cod. Dres., pp. 9, 12, 13, 14, 23.

Regarding it as a counterpart of the tortoise, Dr. Förstemann has given various reasons for holding that it symbolizes the winter solstice and the directions southwest and southeast, and thinks it probable that it is found in the hieroglyph of the month *mol*, which occurs about that season of the year.¹

The frog, Maya, *much*, *uo*, is a well-known symbol of water and the rains. It is shown falling from the sky in Cod. Cort., p. 17; and on p. 12, Itzamna, in his character as a rain god, appears with the body of one.

The scorpion (Maya, *zinaan*) is depicted several times, especially in Cod. Cort., p. 7, and Tro., pp. 9, 13, where it is of large size. Its symbolic sense is not clear. The Mayas applied the term *zinaan ek*, "scorpion stars," to a certain constellation, but it is possible they derived it from the Spaniards. Another possibility is that the animal represents *the earth-plane*. The word *zinaan* is derived from the radical *zin*, which means to stretch out, to extend; and the entire earth, as one extended plane, was called *zinil*.

The rattlesnake appears to be the only serpent which is represented as a symbol. It was distinctively called, both in Tzental and Maya, "the Snake King" (Maya, *ahau can*, Tzental, *aghau chan*). Its rattles were termed *tsab*, and hence its name *ahau tsab can*, also in use. According to the *Dicc. Motul*, the natives believed there were four varieties, corresponding to the four sacred colors, white, black, red, and yellow.

¹ Förstemann, *Entzifferung*, No. III.

It is shown in the Codices, realistically, biting a man's foot, Tro., p. 7; astronomically, in the sky among the stars, Cod. Dres., p. 43; Cort., pp. 12, 13; as the head-dress of the serpent goddess, already described; as the companion of Itzamna and Cuculcan, frequently; as the body of Itzamna, Cod. Cort., 10, in Cod. Dres. and Cod. Tro. It carries the "constellation band," and may generally be regarded as one of the symbols of Time.

11. *Occupations and Ceremonies.*

Among the illustrations are a number which throw light on the habits and customs of the ancient Mayas. We see persons engaged in spinning and weaving, Cod. Tro., pp. 11*, 16*, etc., Cod. Dres., p. 45; others making idols, Cod. Tro., p. 12*, Dres., p. 6, etc. Various religious ceremonies are pictured, as piercing



FIG. 30.—A Religious Function. (From the Dresden Codex.)

the tongue, Cod. Tro., pp. 16*, 17*; baptizing children, which was performed at the age of four years,¹ Cod. Tro., 20*; and the

¹ *Relacion de la Villa de Valladolid* (1579), cap. 14.

important functions at the end of the years, depicted both in Cod. Tro., pp. 20-24, and Cod. Dres., pp. 25-28.¹

A curious scene is that Fig. 29, from the Dresden MS., p. 35.

In the center, resting upon an altar of three degrees surmounted by the sign *caban*, earth, is the head of the god of fertility, his soul escaping from his nostril. Below, on each side of the altar, are two figures, one playing on a flute, the second on the medicine drum. Above are also two, one shaking the sacred rattle, the second squatted before a flaming altar, in one hand the holy staff, *caluac*, while the other lifts above his head the "fish and oyster" sign, symbol of the products of the sea. On the right hand are other offerings, the turkey and the dog; and below them a ladder, *eb-che*, probably signifying the day *eb*, on which this ceremony took or should take place. Its successful result is shown in the picture which follows it in the Codex.

Those who would follow Förstemann's (and my own) views in understanding the Codices, must accustom themselves to look upon the animals, plants, objects, and transactions they depict as largely symbolic, representing the movements of the celestial bodies, the changes of the seasons, the meteorological variations, the revolutions of the sun, moon, and planets, and the like; just as in the ancient zodiacs of the Old World we find similar uncouth animals and impossible collocations of images presented. The great snakes which stretch across the pages of the Codices mean Time; the torches in the hands of figures, often one downward and one upward, indicate the rising and the setting of constellations; the tortoise and the snail mark the solstices; the mummied bodies, the disappearance from the sky at certain seasons of certain stars, etc. A higher, a more pregnant, and, I believe, the only correct meaning is thus awarded to these strange memorials.

¹ These are described at length by Landa, and their representations in the Codices have been explained by Thomas in his *Manuscript Troano*.

IV. The Graphic Elements.

Having made this satisfactory progress in explaining the numeral and the pictorial portions of the Codices, we are well prepared to approach the more difficult part of our task, the interpretations of the hieroglyphs themselves.

Fortunately, an even superficial inspection of the manuscripts shows us that we are not without material aids to this end. It is clear that many of the hieroglyphs are those of the twenty days and the eighteen months of the Maya year, which are preserved to us in the work of Bishop Landa; others, again, by their arrangement, must be connected with the cardinal points; and others suggest, by their appearance and disposition, that they portray the celestial bodies, the sun, moon, and stars; others are in the columns of numerals, and must have numerical values; and others are so related to the pictures that they are plainly a repetition of them in a partial and conventional manner, as the written characters for divinities, which are usually merely the head of the divinity more or less cursively expressed.

1. The Direction in which the Glyphs are to be read.

The first step in the decipherment of any inscription is to ascertain the direction in which it is to be read.

In my earliest essay on this subject,¹ I stated that whatever the prevailing rule in this respect might have been, the native artists had no hesitation in disregarding it, when artistic or other reasons presented themselves. This is the conclusion which has since been arrived at by conservative later students. I shall have numerous illustrations of it to offer in the following pages. Most of the diversity in this respect was not capricious,

¹ "The Ancient Phonetic Alphabet of Yucatan," in the *American Historical Magazine*, for 1870.

however, but in accordance with rules, some of which have been ascertained.

Three points in this connection will immediately attract the attention of the student. The movement of the principal figures in the records, both manuscript and mural, is generally from right to left; the main portion of the composite characters are drawn on the right, and the minor portions or affixes are added on the left;¹ and in placing numerals on a line, the upright strokes which mean the fives are placed to the right, and the dots which mean units less than five are placed to the left. These facts look as if the lines were *written* from right to left. The general opinion, however, is that expressed by Pousse and by Thomas, that the characters when arranged in lines are to be read from left to right, and when in columns from top to bottom.² That this rule does not hold good in a number of instances, as I shall show, need not surprise us, as precisely the same uncertainty in the arrangement is found in the Mexican picture-writing, as Chavero has pointed out,³ and exists to-day in the manuscripts of the Tuaregs of the Sahara.⁴ Dr. Förstemann has shown conclusively that the numerical elements in the long computations to which I have referred (above p. 30) are to be read from below upward and from right to left.⁵

Great aid in settling this question in any given instance can be obtained by a close examination of the *rubrication* of the

¹ A notable exception to this, commented on by de Rosny, is seen on pages 18 and 19 of the *Codex Peresianus*. Why the rule should be reversed in those sections is still a problem.

² *Study of the MS. Troano*, Preface, p. viii.

³ Alfredo Chavero, *Antigüedades Mexicanas*, p. xi (Mexico, 1892). The *Codex Porfirio Diaz* must be read from right to left.

⁴ D. G. Brinton, "The Alphabets of the Berbers" in *Proceedings of the Oriental Club of Philadelphia*, p. 64 (Philadelphia, 1894).

⁵ For instances, the numerals in connection with the snakes in Cod. Dres., pp. 61-64, and 69-73, are to be read from right to left, and from below upward, beginning at the last page of the series, and proceeding toward the left on the extended sheet. Förstemann, *Entzifferung*, No. II, 1891.

manuscript. The native scribe, before he filled in the glyphs or letters, divided his sheet into small compartments by faint red lines, bounding as it were the different sentences or paragraphs he intended to set down. Each such sentence consists usually of four or six characters, arranged either in a column or in a square, the whole of which may be called a "cartouche." The following diagram illustrates the manner in which the separate glyphs are to be read in ordinary cases :—

<i>a</i>	<i>a</i> <i>b</i>	<i>a</i> <i>b</i>	<i>a</i>
<i>b</i>	<i>c</i> <i>d</i>	<i>c</i> <i>d</i>	<i>b</i>
<i>c</i>			<i>c</i>
<i>d</i>	picture	picture	<i>d</i>

Without the aid of the rubrics, from an independent study of the characters themselves, M. Pousse demonstrated that this is a necessary arrangement of the majority of the written passages.¹

The signs for the days are usually placed in columns on the left of the groups of hieroglyphic characters, the numeral belonging to each being inscribed above it; while immediately below the groups are numerals in black and red, generally indicating certain days. This disposition of the elements of the writing shows that it was intended for a "time-count," as I have before stated. For the somewhat voluminous analysis of the Codices in this direction, the reader is referred to the works of Förstemann and Thomas, who have paid fruitful attention to this department.

¹ In the *Archives de la Société Américaine de France*, for 1887, pp. 27, 28, 113 etc.

2. *Composition of the Glyphs.*

I have already stated, p. 10, that the main elements of the Mayan hieroglyphic writing are not numerous. The apparent complexity of many of the glyphs arises from the combination of a number of frequently recurring elements which are placed in different positions and relations, and each of which has many variant forms, dependent on the degree of skill or care of the scribe or sculptor, and the material which he used for the record.

Usually each glyph or katun consists of one main element with a number of others drawn in or around it, which are generally known as "affixes." An element within another is called an "infix;" placed in front of it, a "prefix;" behind it, a "suffix" or "postfix;" above it, a "superfix;" and below it, a "subfix." The same element will often be found first in one and then in another of these positions; and a certain class of elements are employed as affixes only. I shall refer to the single elements as "simple characters," and to the complex glyphs as "composite characters."

3. *The Proper Method of Studying the Glyphs.*

The proper method to adopt in studying composite characters is first carefully to separate them into the simple characters of which they are composed, noting the relative positions of these.

The next step is vitally important and often most difficult. It is to determine what visible objects these simple characters were intended to represent. They are often so conventionalized or so negligently sketched that the most careful students have reached absurdly different opinions as to what they were designed to portray.¹

This identification accomplished, the student should proceed to

¹ In this connection I would call the especial attention of students to the article by Dr. Schellhas, "Vergleichende Studien auf dem Felde der Maya-Alterthümer," in the *Internationales Archiv für Ethnographie*, 1890. He there illustrates their methods of tattooing, wearing the hair, personal ornaments, costumes, utensils, etc., as shown in the Codices and other remains.

ascertain the name of the object in the Maya language ; because, though it may be employed as pure ideogram in one connection, in another it may be used for its phonetic value according to the " ikonomatic," or rebus method, as I have above explained, and instances of which I give in these pages. I do not believe that a further phonetic analysis—that to the isolation of distinct alphabetic elements—as has been pursued by a number of writers already referred to, is justified by the nature of the Maya script, or will yield useful results.

4. *An Analysis of Various Graphic Elements.*

I shall now proceed, in the manner above described, to examine a number of simple and composite characters, not by any means exhausting the stock, but rather merely offering suggestions and examples for future students. In their application it must always be remembered that any Maya character may be employed in either of three values: 1, As an ideogram; 2, as a rebus; 3, as an astronomical or numerical sign.



FIG. 31.—The Hand.

The *hand* contributes to some of the most numerous hieroglyphs in the Mayan writing; and the significant poses assigned it in the pictures and statues prove how expressive it was to this people.

The forms presented Fig. 30 by no means exhaust its delineations. They are drawn from gesture-speech and each is significant. No. 1, from the Cod. Cort., is the usual sign "to give;" No. 2, from the Cod. Tro., shows it in hasty writing; No. 3 is the hand closing ("la main qui se ferme," Brasseur). It is the sign for the day *manik*, and is explained by Dr. Seler, "to eat;" but I take it to be the rebus for *mach*, "to grasp" ("asir, tomar con las manos," *Dic. Motul*). No. 4, the hand closed, thumb downward (*pollice verso*), has probably an inauspicious significance (very common, *c. g.*, Cod. Per., pp. 2, 3, 6, 7); No. 5 is the "supporting hand" (very frequent, usually in composition); No. 6 is intended to show the hand, palm upward, forming a cup (Cod. Dres., p. 40, Cod. Tro., p. 21),—it would signify "offering;" No. 6½, from the stelæ of Copan, must mean union or friendship. The two hands held as No. 7 occur repeatedly in Cod.



Dres., pp. 6, 7, in the Tro. and Cort. often thus, to which

Thomas, by means of his "key," assigns the wonderful meaning, "a meat pie"! Nos. 8 and 9 are explained by Seler as the supporting hand; No. 10 shows the hand and arm pointing; No. 12, Cod. Tro., 30, 31, is the index finger extended; No. 11, Cort., p. 28, shows the closed hand as a suffix to the sign *ik*.¹

Phonetically the hand is *kab*, which also means "arm, finger, juice, sap, tears;" and as a rebus it could stand for *kaba*, name.

By some writers all the signs, Fig. 32 are supposed to represent the *eye*. Nos. 1 and 2 may also stand for a tooth, and for the small bells worn as ornaments. No. 3 has been called the "weeping eye," and by Brasseur "une hache;" but I take it

¹ On the interpretation of these and allied signs the student should consult Garrick Mallery, *Sign Language among the North American Indians*, in *Rep. of the Bureau of Ethnology*, Vol. 1, and W. P. Clark, *The Indian Sign Language* (Philadelphia, 1885). It is not possible for me here to give more than the most meager details on this important topic.

to be the space within the closing hand (Figs. 31, No. 3). No. 4 shows the eyelashes of the closed eye, and signifies sleep or death. No. 5 is the "ornamented" or "serpent" eye, and, according to Thomas, is the characteristic of a deity. Nos. 6 and 8 are supposed by Seler to be the eye torn out. They are extremely common affixes. Schellhas explains No. 6 as "the head and creeping foot of a snail." I am persuaded that it is a bird's wing, or the chief feather of a wing, and means "superior," "supremacy," or something of that kind.¹ For that reason it always appears in the sign of Kin ich ahau. No. 8 I regard also as copied from a feather ornament.² No. 7, called by Seler the "bleeding eye," I take to be a sign for stars.



FIG. 32.—The Eye and Similar Figures.

In Maya, *ich*, the eye, also means "face" and "twins."

The design, Fig. 33, No. 1, abundant in the Codices and on the stone and ceramic remains, shows eyes, but is believed by Förste-

¹ Bird's wing in Maya is *xik*. Close in sound is *xikal*, queen (señora principal, *Dicc. Motul*). The first wing feather was also called "a knife" (la primera pluma de la ala del halcon se llama "cuchillo mæstre," "*u cicil ulum*," *Dicc. de San Francisco*).

² In the museum of the University of Pennsylvania there is a beautiful vase from Guatemala, with a vitrified surface; on it a face and head, with a necklace entirely of this sign, repeated in a pattern.

mann to represent the planet Venus, and to be a variant of Fig. 37, No. 4. Seler thinks it an ornamental *kin* (see Fig. 36). It is carved on the great tortoise of Copan, and Nos. 2, 3, and 4

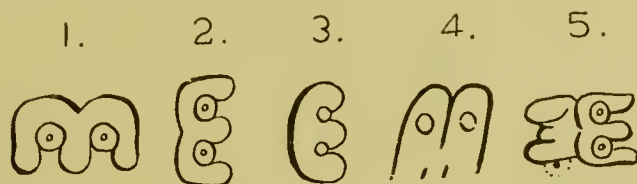


FIG. 33.—The "Spectacles."

are from the pottery of that city, on which it is the most common glyph I have noted. In No. 5, from Cod. Dres., p. 57, it is postfixed to a human figure reversed. Brasseur explains it as "the spectacles of Tezcatlipoca," and for a name we may call it "the spectacles glyph."

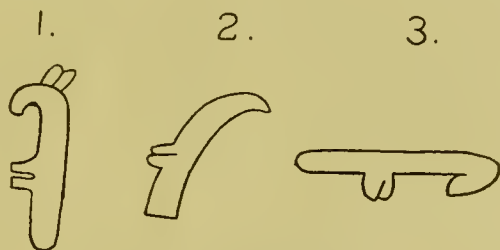


FIG. 34.—The Ear.

The human *ear* has been represented by No. 2, Fig. 34, as has been proved by de Rosny and Thomas. No. 1 (Cod. Cort., p. 16) is either an ear or an ear ornament. It is not the ordinary ear-ring, which is clearly shown in Figs. 12, 17, etc. This latter is often used as an affix, and has been confused with the serpent rattle, and with No. 3, which is the lower jaw bone, *cham* or *camach*. (See Cod. Cort., pp. 35, 36, etc.)

The ear is *xicin*, which also means "shell." Ear-rings are *tup*, a word which as a verb signifies "to stop up, to cover over, to extinguish."¹

¹ " *Tup*; ciertas arracadas de palo antiguas; y llamanse ahora las arracadas ó zarcillos." *Dicc. Motul*.

The group of signs, Fig. 35, beginning with a person seated, are, in the opinion of Seler, all derivatives from "man." Nos. 2, 3, and 4 he calls "eyes," and Nos. 5-11 outlines of the mouth, jaws, and face, with a general value, "person." Other suggestions are, that the crescentic outlines, Nos. 6, 7, 11, refer to a crescent moon, or an ear (Schellhas), or to a serpent's mouth (Allen); while No. 10 may be an eye and eyelashes (Allen), a comb (Valentini), a claw, a feather, part of a plant, etc. It may be called the "comb sign."¹

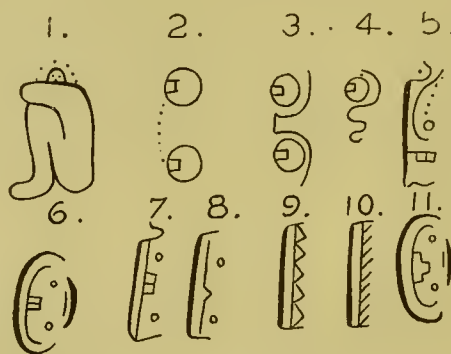



FIG. 35.—Crescentic Signs.

My belief is that some of these affixes show the necklace on which beads and precious stones were strung. This was called *u*, which is also the word for moon, and in sound is akin to *uil*, food.²

By the latter fact I would explain the frequent appearance of this sign  on the neck of vases and on haunches of venison (Cod. Tro. 22, etc.). The picture of a necklace shown

¹ In Maya a comb is *xel*. This as a verb means "to cut in two;" and as a numeral prefix it divides in half unities less than 20; as *xel u yox kinbe*, "two-and-a-half-day journeys." Ikonomatically, the comb sign may have these significations. Landa gives it as the sign for *ca*, perhaps, as Valentini suggests, for *cac*, to pull out hair.

² *Uil* also means anything favorable or advantageous—"cosa provechosa," *Dic. Motul*. The word *u* never means "vase," as Prof. Thomas has repeatedly stated, following the unreliable Brasseur.

in the *Lienzo de Tlascala*, p. 7, will demonstrate how close is the resemblance. That in Landa's alphabet (see above, p. 15) this sign is given for *u*, confirms my supposition.

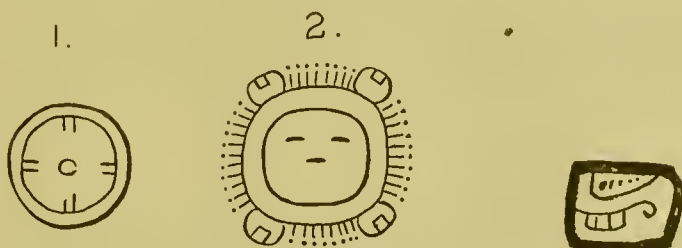


FIG. 36.—Sun and Moon Signs.

The hieroglyphs of the *sun*, Fig. 36, Nos. 1 and 2, cannot be mistaken. In the latter, the four teeth indicate the biting heat. This design often occurs on war shields. No. 1 is that usually employed in composition. The word for sun is *kin*, which has the further meanings, "day, light, festival, time, news, to rule;" from it are derived *kinal*, "heat, hot;" *kinam*, "strength, bravery, power, poison, fear, veneration;" *ah-kin*, "a priest," etc. The *kin* sign usually indicates a beneficent divinity.

The third sign in Fig. 36 is that for moon (Schellhas). Dr. Seler, however, claims that it is the symbol of "night," and that where it means 20 (see above, p. 21), it is not derived from *u*, moon, but from *uinic*, man. He explains the figure as a human head with a "bleeding eye," and bare teeth.

In all these points I think he is in error. Maya grammar does not authorize the derivation of *uinal* from *uinic* (in which Seler follows Brasseur); but it may come from *u*, month, *uin* or *uen*, "relating to a month." His statement that the 20-day period was not spoken of as an *uinal*, is disproved by Landa, who calls it *uinal hun ekch*, "a dark month," to distinguish it from one lighted by the moon. A close examination of most of the drawings will show that the line on which the supposed bare teeth are shown is not that of the mouth, but that of the necklace above mentioned, which has the value *u*. Cf. Fig. 3, No. 3.

No. 1, Fig. 37, I introduce from Mexican pictography; it is the sacred green jade jewel, the *xihuitl*, meaning "precious, divine." By it I explain the very common No. 2, a modification either of it or of the *kin* sign, constantly associated with deities (on the hand, Cod. Dres., p. 21; on the leg, id., 12; on the back, id., 39; and always on the head-dress of the God of Growth).

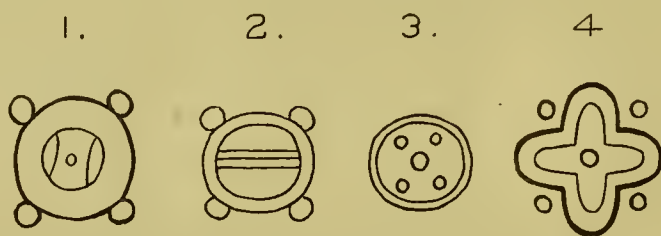


FIG. 37.—Supposed Derivatives of the Sun Sign.

No. 3 may be a modification of the *kin*. It is given in Landa's alphabet, where it stands for *be*, footprints. It may also be the stones of the hearth, and signify "house." As a "directive sign," it stands for the point south, and the color yellow; and it appears as an occasional variant of the day-signs *lamat*, *muluc*, and *chuen*.

No. 4 is thought by Seler to be merely an ornamental form of the *kin* sign; but by Förstemann is taken for the monogram of the planet Venus, at least in the Cod. Dres., where it is very frequent on pp. 46-50. It is repeated with slight variations on the Copan pottery.



FIG. 38.—The Knife Signs.

The flint knife was an important implement. Landa speaks of the numerous large ones kept by the priests for slaughtering

their victims.¹ They were called *ta*, and *licil dzicil*; in Tzentel, *chinax*, from *chi*, to bite. Fig. 38, Nos. 1, 2, and 4, show the usual forms in which they are drawn, the small squares at the end being the biting edges. No. 3, surmounted by the "trinal" sign, refers probably to lightning. No. 6 is a rare sign for a dog, showing his biting teeth (Cod. Tro., p. 25). The flint knife typifies sacrifice, death, war, the East, and fire. As a rebus, it could stand for *ta*, excrement; *tah*, a dramatic representation, etc.

No. 5 is a very common affix. It has been regarded as a variant of the knife (Seler, etc.). But it is too constantly distinguished from it to have this meaning. I consider it the sacred bean, with which divination was practiced and lots cast. This was called *bul*, a word which, as an affix, means "all," the whole of anything, as *bulkin*, "the whole day." This may suggest its signification.

The curious objects in Fig. 39 were long a puzzle to me, and have not been explained by previous writers. I believe them to be representations of the food products of the sea, showing a fish and two shellfish. My reasons for this are that in Cod. Dres., p. 34, they are seen along with other food-offerings (see Fig. 30); in some places the fish tail is unmistakable (Cod. Dres., pp. 6, 7, 36); in Cod. Cort., pp. 20, 21, they are associated with a fishing bird,—a pelican or cormorant; in Cod. Dres., p. 50, the two shells are replaced by one conch shell; and in Cod. Dres., p. 67, a fish and two shells are painted separately, to represent food from the sea. The two shells are often seen in other relations, as sprinkled with blood (Cod. Tro., p. 18*), and as an affix (see Fig. 31, No. 10). I shall refer to this as the "fish and oyster" sign.

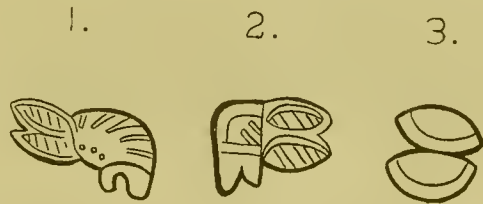


FIG. 39.—The "Fish and Oyster" Sign.

¹ "Los navajones para los sacrificios, de los quales tenian buen recaudo los sacerdotes," p. 107, Ed. Madrid.

Shells had a peculiar sacredness in Maya symbolism. The robes of some of the priests were bordered with them.¹



FIG. 40.—The Sacred Food-Offerings.

Some other sacred food-offerings are shown in Fig. 40. The first is the haunch of venison tied up (identified as such by Brasseur); the second is the fish, here shown with a subfix; the third is the wild turkey, represented by his head in a dish. Another is the iguana (see p. 122, No. 14); and a fifth is the object shown on p. 122, No. 12. It has been explained as a grain of corn sprouting from the ground, or a mole emerging from its hole (Schellhas). The true explanation is that of Brasseur, that it portrays the forequarter and head of a food-animal, tied up. He does not specify what animal, but in some of the drawings I distinctly recognize the dog, with his sharp teeth, the species raised by the Mayas to be eaten on festival occasions, as stated by Landa.²

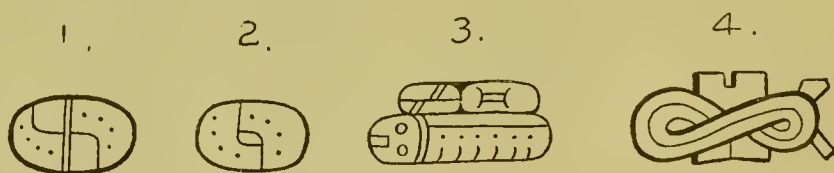


FIG. 41.—The *ben-ik* and other Signs.

Nos. 1 and 2, Fig. 41, are variants of an element often occurring with a *ben-ik* prefix. Dr. Seler, who is apt to see gory

¹ *Relacion de la Villa de Valladolid* (1579), Chap. XIV. I am aware that some variants of this glyph have a striking resemblance to a *penis flaccidus cum testiculis*; but after close comparison I have rejected this rendering. Thomas sees in the two shells "tortillas."

² *Cosas de Yucatan*, p. 112 (Ed. Madrid). What looks like the *kan* sign below it is the strap which fastens it.

human heads everywhere, thinks it is one carried in a sling and means "conquered in war."

Dr. Förstemann, with greater probability, considers that it symbolizes an astronomical event connected with the motions of the sun. (See the significant designs, Cod. Tro., 28* *b*.)

The *ben-ik* sign referred to is rendered by Seler to mean conquest and destruction; by Förstemann, astronomically, as the lunar month of 29 days; in a general sense, I would say, "strength and deific power." It is a very constant association of the two day-signs so named, *ben* giving the idea of motion, and *ik* of life and power.

In No. 3 is a long worm-like figure under the *ben-ik* sign. Brasseur pointed out that it is a variant of the day-sign *men*, and explained it as a caterpillar (*chenille*). Seler speaks of it as an eagle, and as a symbol of "mother earth;" Schellhas, as perhaps the serpent goddess. It sometimes is drawn to have a fish-like appearance (Cod. Per., p. 7), and may symbolize the waters; the more so as it has occasionally as a superfix the "cloud-balls."

No. 4 is explained by Brasseur as the girdle, *xoc*, around the body; and I prefer this to later suggestions. A similar design was the tress of hair, *kax pol* or *kaaxi*, worn by women (see Cod. Tro., p. 27; Cod. Dres., p. 45). Its signification would seem to be "to tie together, to join," or, as a rebus, "rain, to rain," for *kaxala* (llover, y la lluvia).

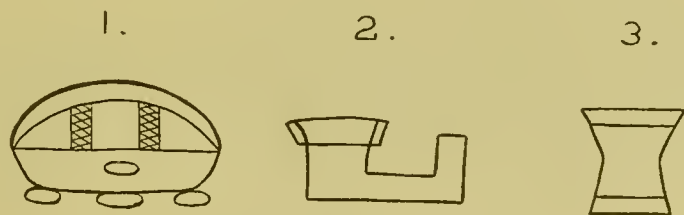


FIG. 42.—The Drum Signs.

No more prominent hieroglyph than No. 1, Fig. 42, can be found in the Mayan inscriptions, and none which has proved such a stumbling block to interpreters. Valentini has called

it the picture of a censer or brazier; de Rosny thought it a variant of the *ahau* sign; Dr. Seler explained it as a precious stone; and Thomas as "a stone heap!" It is the upper figure in the "Initial Series" of glyphs at Palenque, Copan, Quirigua, etc. (see above, p. 24), and recurs with but slight variations in all the Codices.

I first announced what it represents and its signification at the meeting of the American Association for the advancement of Science, August, 1894.¹ It is the picture of a *drum*, the large variety, made of the hollow trunk of a tree resting upon short feet, the trunk being sawed across partly through so as to give two vibrating surfaces, which were often decorated with cross-hatching. Such drums are described by the early Spanish writers, and one is shown in the Atlas to Duran's History.² Their sound could be heard for two leagues, and they were important adjuvants in the services in the temples.

In the hieroglyphics the significance of this design is primarily phonetic. The name of this particular kind of drum was *pax che*, from *pax*, musical instrument, and *che*, wooden; a large one was *bolon pax che*, the word *bolon*, nine, being a superlative prefix in Maya. Employed according to the ikonomatic method, this expressed the word *paxan*, a very common term in Maya, meaning "it is finished," and applied to anything completed, ended, or destroyed, in a good or bad sense.³ This is


¹ Mr. Marshall H. Saville, in a paper published in the *Journal of American Folklore*, September, 1894, and stated to have been read before the American Association the preceding month, entitled "A Comparative Study of the Graven Glyphs of Copan and Quirigua," observes of the design of the *paxche* that it "is probably a drum." No expression to this effect was in the paper as read before the Association, and in the following number of the *Journal* Mr. Saville concedes that I was the first to offer this identification.

² Duran: *Hist. de las Indias*, Trat. I, Lam. 29; Trat. II, Lam. 6.

³ I quote the explanation from the *Dicc. de Motul*,—"Paxaan: cosa que esta quebrada, como vasija, cabeza, barco, etc.; cosa que esta desaparecida; *paaxan in cab*, huido se me han mis abejas; *paaxan in cuctel*, *paaxan in cahal*, despoblado se me ha el pueblo, ido se me ha mi gente. Y asi se puede decir de muchachos, de hormi-

why in the numeral signs it marks the end of a series (see above, p. 22), and in the so-called "Initial Series" (which I believe to be terminal), it surmounts and thus closes (reading from below upward) the rows of computation signs. For the same reason it is the support of the figure representing the dying year in the ceremonies at its termination (Cod. Tro., pp. 20-24), and is often associated with the deities of old age, destruction, and death.

Several other varieties of drums were in use among the Mayas. That shown Fig. No. 2, is noteworthy. It is the *dzacatan* (Berendt), or medicine-drum (from *dzacah*, to cure, to practice medicine). It was used in the sacred ceremonies (see Fig. 30), and Itzamna is portrayed playing upon one (Cod. Dres., p. 34). Its representations in the Codices are peculiar, and have been entirely misunderstood by previous writers. I show them in Fig. 43, Nos. 1, 2, 3. In a more highly conventionalized form

we find them in the Cod. Troano, thus :  which has

been explained by Pousse, Thomas, and others, as making fire or as grinding paint. It is obviously the *dzacatan*, what I have called the "pottery decoration" (see p. 58) around the figures, showing that the body of the drum was of earthenware.

Fig. 42, No. 3 shows the ordinary hand drum, the *huchuetl* of the Mexicans. Its name in Maya is *tunkul*, properly *tankul*, which means either "before the gods," or "now one worships" (ahora se adora, Baeza.) It was either of wood and was struck with a stick ; or of pottery with a skin stretched over its mouth, when the sound was produced by the fingers. Some were large and stood upright, as shown in Fig. 43.¹ Representations of these are

gas, humo, niebla, nublados, dolor de cabeza, de la voluntad, etc., anadiendose al *paaxan* el nombre de la cosa." In a similar sense the phrases *paaxal yit caan*, "the edge of the sky is broken," *paaxal u chun caan*, "the beginning of the sky is broken," are translated, "reir el alba, venir el dia, o amanecer asi."

¹ In the Tzental dialect the drum entirely of wood was called *culinte*; that with a skin stretched across it, *cayob*. Lara, *Vocabulario Tzental*, MS.

common in the Codices, and have generally been mistaken for vases. (See Cod. Cort., p. 27.) Even Nos. 4 and 5, Fig. 44, are probably some such musical instruments. (See Cod. Cort., pp. 12, 30, 31.)

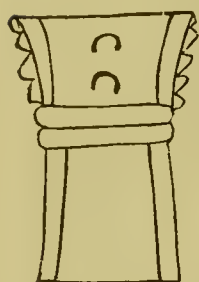


FIG. 43.—A Standing Drum. (From the Cortesian Codex.)

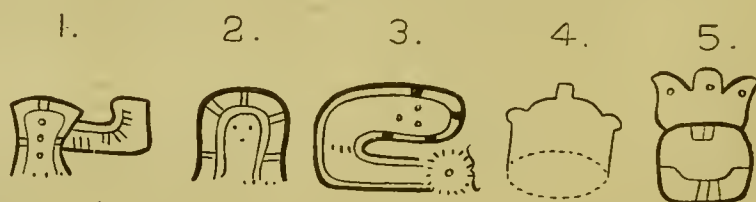


FIG. 44.—Graphic Delineations of Drums.

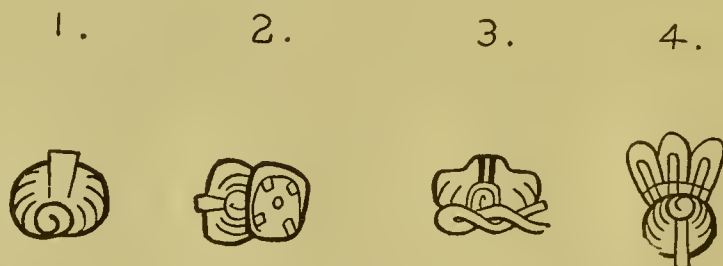


FIG. 45.—The *yax* and other Feather Signs.

Few glyphs are more frequent than No. 1, Fig. 45, either alone or in such combinations as Nos. 2 and 3. The guesses as to what it represents have been singularly divergent. Brasseur said, a kind of gourd; Seler, a tree; Schellhas, the zapote; Rosny and Förstemann, the phallus, etc.

None of these suggestions seems to me tenable. I believe it represents a common feather decoration made of short green or blue feathers, attached to a style or staff. It is frequent on Mexican and Maya figures, and in No. 4, Fig. 45, I copy one from a Maya war dress. The lower portion represents the ornament to which I allude. It was called *yax kukul*, and this

gives the phonetic rebus value of the sign, which is *yax*, green, and (metaphorically) new, young, fresh, strong, virile, etc.

Care must be taken not to confound this with the character seen in the sign of the dog (see p. 70), which really represents the ribs and breast-bone, although called a "phallus" by Rosny, an "article of food" by Thomas, a "breast-plate" by Allen, and a "vertebral column" by Seler.¹



The three feathers which surmounted the *yax kukul*, as shown in No. 4, Fig. 45, also developed in the hieroglyphs to an important sign. It is shown in Fig. 46, No. 1, and is the uppermost sign in the "Initial glyph" of Palenque (see p. 137) and was a mark of eminent distinction. (See Fig. 47, No. 2.)

These three feathers indicated in Maya symbolism the highest place and power. They appear on the head of the important statue unearthed by Dr. Le Plongeon at Chichen Itza, which he calls "Chac Mool," in the form given Fig. 46, No. 2. Three was a sacred number with the Mayas, and with this in mind I shall refer to it as the "trinal" sign.

In Mexican writing the three feathers appear in the ikonomatic sign for *tecpan*, royal, in the *Lienzo de Tlascala*, pp. 56, 57, 78. As feather in Maya is *kukum*, which is allied in sound to *ku*, god, *kul*, divine, etc., we see what an appropriate rebus the "trinal" makes.

Rounded figures, identified by Seler as "feather balls," are sometimes portrayed above the *men*, or "Mother Earth" sign, and in other relations. See Cod. Peres., p. 7, for a good example.



FIG. 46.—The "Trinal" Feather Emblem.

¹ A similar design is found on Mexican shields, e. g., *Lienzo de Tlascala*, plate 12, *Cod. Porf. Diaz.*, lam. s. and on the curious sculptures at Monte Alvan, Oaxaca, figured in Captain Dupaix's Second Expedition, plate 21, in Kingsborough's *Mexican Antiquities*.


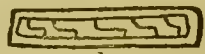
A number of drawings in the Codices represent textile materials—mats, cotton cloth, wicker-work, etc. That Fig. 47, No. 1



FIG. 47.—The "Cross-hatched" Signs.

is frequent, both as an affix and as part of costume. Thomas calls it a trellis or lattice work; Seler, an imitation of a snake skin; Förstemann, of the shell of a tortoise. In some places it is clearly a part of a helmet made of interlaced and twisted cords attached to a frame. (See Cod. Tro., pp. 2, 3, 6, 19, 22*, 23*.)¹ In Nos. 2 and 3 it appears as a written character with superfixes. It forms part of the sign of the day *chicchan*, and is attached to the sign of the sun and of the world.

This cross-hatching I regard as showing woven stuff, or that twisted, knotted, and plaited; and I consider its value when used phonetically to be "strong, mighty," because the word for "strong" in Maya is *chich*, and that for twisting and interlacing cords is *chich-kuch*,—again a simple rebus.²

The designs, on p. 129, are supposed by Seler and Thomas to represent a house, the roof of which is indicated by the cross-hatched or plaited objects,  and .

I regard them as meaning a *canopy*, the practical and symbolic uses of which article are often referred to by the early visitors to these tribes.³

¹ Probably the "morrones de madera," to which early writers allude as part of the armor of a Maya warrior.

² "Torcer hilo con huso; *chich kuch*. Hilo torcido; *chichin bil kuch*." *Dicc. de Motul*. Meanings of *chich*, are: "strong, swift, hard, violent," also "grandmother."

³ Father Ximenes speaks of the "asiento del rey;" "tenia un docel de pluma; sobre el guarda polvo, tenia cielos de diversos colores, tres, dos, etc." *Origen de los Indios de Guatemala*, p. 196. The symbol is therefore one of power and authority, rather than of a mere inanimate object.

In Fig. 48, No. 1, I give a frequent postfix. In the pictures it portrays the wing of a bird, the foot of an animal, the claw of a reptile or insect, or the tail of a dog (Cod. Tro., p. 27).

No. 2 is the conventional sign for *smoke*, as may be seen in Cod. Tro., pp. 5*, 6*, etc.

No. 3 is called by Seler an ideogram for "man" or "person."

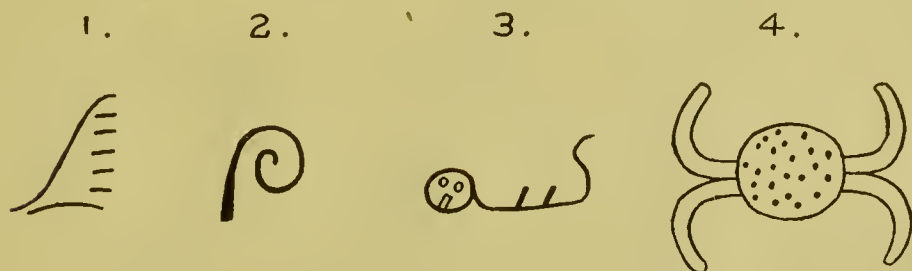


FIG. 48.—Some Linear Signs and Dots.

No. 4 I introduce from the Mexican pictography to illustrate the use of black dots. They have many significations which I have not traced in Mayan Codices, such as seed, salt, ashes, stars, sand, earth, and from the latter, place, region, world.¹ In the sign for the day, *ix*, I believe we see the dots with the signification *xix*, "grain-husks." A line or lines of dots mean "speech" or vocal sound, as attached to the drum, Fig. 44, No. 3; coming from the mouth of a dog, Cod. Tro., p. 20, singing, etc. Some have mistaken this for the sign of death.



FIG. 49.—The Use of Dots.

Dots in Maya are *ua* or *ual*, akin in sound to *u*, month, *uil*, food, and may be allusive for these ideas.

¹ See Antonio Peñafiel, *Nombres Geograficos de Mexico; Estudio Jeroglifico*, passim (Mexico, 1885). I would especially recommend this easily obtainable work to the student who would familiarize himself with the method of "ikonomatic" writing as it was used by the ancient Mexicans. Another series of admirable examples are in the "Lienzo de Tlascala," published by the Junta Colombina (Mexico, 1892), under the editorship of the distinguished antiquary, Don Alfredo Chavero.

The *kan* and *imix* signs are often associated under two superfixes enclosing dots, as in Fig. 49, No. 1. These have been interpreted by Seler to indicate copal gum, or the burning of incense. The sign is associated with various deities, especially those of a beneficent character.

The same objects, however, occur elsewhere as superfixes over various glyphs, as Fig. 49, No. 2, where it is not easy to assign them any such meaning.



FIG. 50.—Linear Prefixes.


Modifications of Fig.

50, No. 1 are quite frequent. This sign has had various explanations, as typifying fire, lightning, or wind (Seler, Schellhas); but I believe it represents divine or magical power

exerted by blowing. As I have explained in my *Nagualism*, "the act of blowing was the essential feature in the practice of the 'medicine men.' It symbolized the exercise and transfer of spiritual power."¹ Where the deity is portrayed with this addition, he is in the act of exerting his divine influence. For examples, see the "bee god," in Cod. Tro., pp. 5* and 10*, where the head is as in No. 2; and the scorpion, in Cod. Tro., p. 2, precisely like one in the Cod. Porfirio Diaz, lam. 1. At times it also conveys the idea of speech, or vocal sound, or that from a drum, etc., *e. g.*, Fig. 44, No. 3.

No. 3 represents the usual mode of portraying the antennæ of scorpions, insects, etc., of interest because the word for these in Maya, *matzab*, also means the rays of the sun and of light, and the figure might so be interpreted.

¹ *Nagualism; a Study in Native American Folk-lore and History*, p. 20, note. Sometimes water was used, when the word in Maya is *puhaa*, "to blow water," and is translated in the dictionaries, "rociar con la boca."

Dr. Förstemann believes that the circle of dots, as in the lower portion of No. 2, means "movement or precession;" as in Cod. Dres., p. 68. The  sign is so surrounded, indicating the junction of two time-periods; or, as others would say, the crooked lightning darting from the sky.

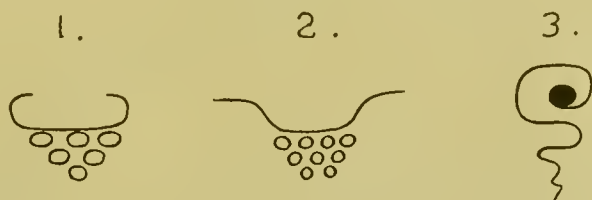


FIG. 51.—The "Cloud-Balls" and the "Cork-screw Curl."

In Fig. 51, Nos. 1 and 2, copied from the great tortoise of Copan, show the rain-clouds as conceived by the native artist. In the Codices they are seen in the day-sign *cauac*, and elsewhere. An almost identical conception appears in the pictography of the northern tribes.¹ Seler speaks of them as *Wolkenballen*, "cloud-balls," an appropriate name for the element.

No. 3 has been explained by Thomas and Seler as the portrayal of trickling fluid; or, again, by the latter, as a "nose ornament." Dr. Schellhas first saw its real intention. It is a picture of a twisted lock of hair, or "cork-screw curl," worn by



a

FIG. 52.—Symbols for the Earth.

the Maya women. It appears in the monograms of various goddesses. Ideographically it has two meanings, one, woman or

¹ Mallery: *Picture Writing of the American Indians*, p. 700. The double curves that we see on the snake, Cod. Cort., p. 15, etc., I construe as the sign of the sky. The expression in Maya was *u nak caan*, "la boveda del cielo;" literally, the "belly" of the sky.

female; the other, down or downward; either from its name (which we do not know), or because it hangs downward. In the latter sense, it is in the hieroglyph of the Earth, as that which is down or below us, Fig. 52; although, as the Earth is the feminine principle in nature,—Mother Earth,—I would suggest that this is the intimation conveyed by the sign.

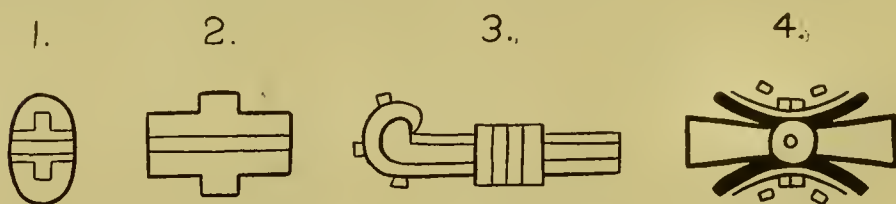


FIG. 53.—Signs for Union.

No. 1, Fig. 53, occurs with great frequency. Allen explains it as “the radical of the mouth,” others as “falling water,” etc., but I accept without hesitation Brasseur’s identification of it as the side view of the joint of a reed or maize stalk, with the meaning “union.” In the writing it is probably among other things the conjunctive conjunction, *yetal*, “and,” which explains its frequency. It is common in the form No. 2, in the Vienna Codex, signifying the union of day series (pp. 58, 61, 64, etc.); it may imply sexual union, as in the “Tableau des Bacabs” (see above, p. 50.)

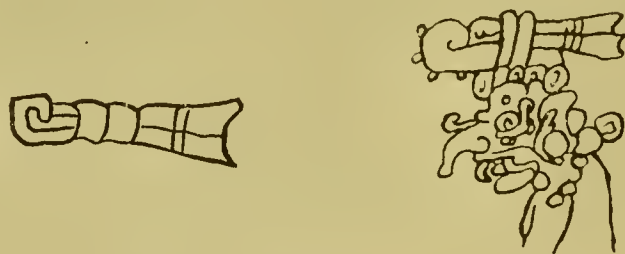


FIG. 54.—The Knotted Head Dress.

Other signs for union are No. 3, which is a knotted head-dress common on males, and No. 4, from the Cod. Troano, p. 5, which

perhaps indicates the union of two month periods, or the new and old moons, in relation. The middle design between the two crescents is frequent as an affix (*e. g.*, Cod. Tro., p. 7, etc.).

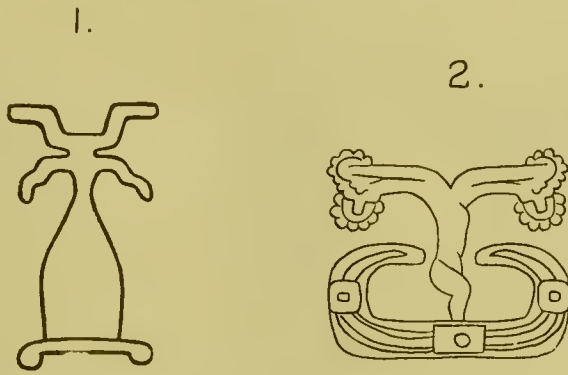


FIG. 55.—The "Tree of Life."

I have already hinted at the significance of the "tree of life" in Mayan mythology. It is shown in the Codices under two forms, Fig. 55, Nos. 1 and 2. In the former it seems to be growing from a bottle-shaped vase. The leaves (omitted in this instance) are well shown in Cod. Tro., p. 17*. They are cordate and pendent.

No. 2 is taken from the Cod. Peres., p. 3; it beautifully shows the sacred tree, here distinctly anthropomorphic,¹ in the vase of the heavenly waters, lifting its fourfold branches. In the original, the god of the north star is resting upon them. Usually the tree is associated with Itzamna. Both forms are frequent in the Mexican manuscripts, and the myths relating to them have been subjects of study by various writers.²

¹ The transformation of the human into the arboreal form and its opposite are frequently referred to in the myths and pictography of the red race. Some interesting observations upon this point, by the Rev. S. D. Peet, may be found in the *American Antiquarian*, for September, 1894.

² See the Codex Borgia, plates 8, 16, 17, 18, 19; Cod. Vaticanus, plate 65; Cod. Colomb., Lam. 5, 17; Cod. Vienna, pp. 18, 37, etc.; and consult Pousse in *Arch. de la Soc. Amer.*, 1887, p. 102; Schellhas, *Zeitschrift für Ethnologie*, 1886, p. 53.

Forms like Nos. 1 and 2, Fig. 56, and perhaps No. 3, are usually taken to represent a chopper or *machete*. The representation of this weapon or implement is seen in Cod. Tro., p. 17, where

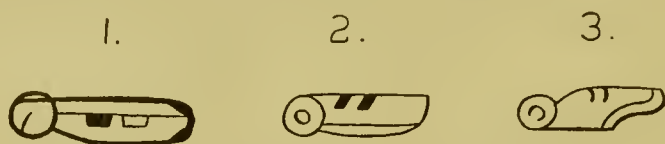


FIG. 56.—The "Machete" and Similar Signs.

a man is killing a snake with one. In the conventional and negligent manner in which these characters are often written, it is not easy to distinguish them from others of different origin and meaning. Nos. 2 and 3 may be feather signs. Seler explains the machete as the symbol of striking or wounding ("Ausdruck des Schlagens").

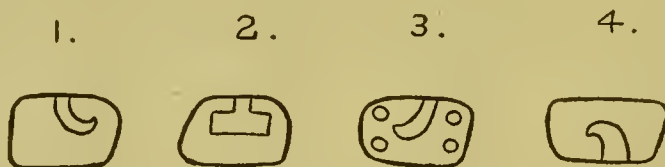


FIG. 57.—Supposed Bird Signs..

Characters like the above recur in all the forms of writing. No. 1 has been called by Seler the representation of "man," but this is doubtful. It may be a variant of No. 2, which is a "closing hand" from Fig. 31, No. 3. Nos. 3 and 4, from Copan and Guatemalan pottery, follow closely the Codices. With a "comb affix," Förstemann calls No. 4 "a well-known form of *moan*," meaning the Pleiades (*Entziff.* IV); while Dr. Seler explains it as an owl symbol. The design enclosed is held to depict the bill of a bird.

The "Crotalean curve," the outline of the jaws of the rattlesnake, *Crotalus horridus*, has been dwelt upon with emphasis by Allen and Maudslay as one of the most notable emblems in

Maya art.¹ Fig. 58, Nos. 1, 2, 3, 4, show some of its forms in the Codices, and No. 5, from Stephens, illustrates its radical. As a graphic element, it is less prominent than in architecture.

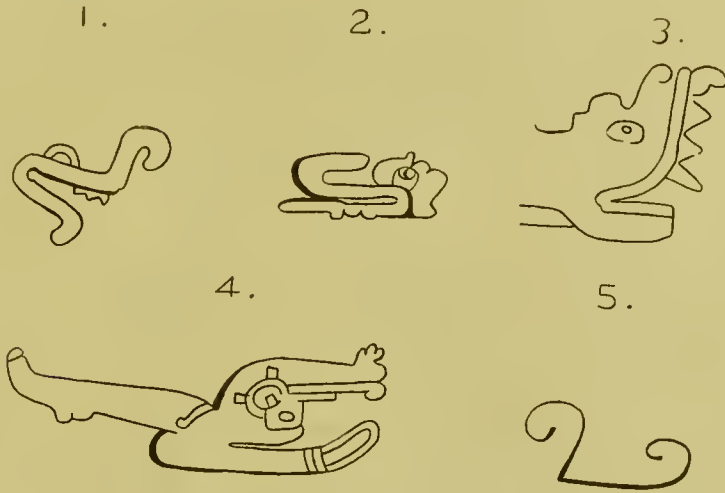


FIG. 58.—The "Crotalean Curve."

Fig. 59, Nos. 1-4, are outlines of objects often seen in the Codices. No. 1, which looks like a carriage-wrench, is in fact a

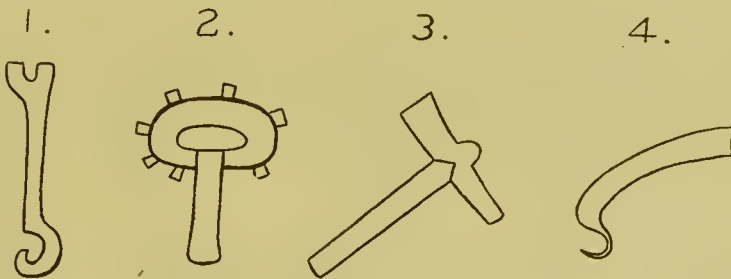


FIG. 59.—Objects Held in the Hand.

serpent wand, as can readily be seen by comparing Cod. Tro., pp. 6, 7, 31*, with Cod. Dres., pp. 40, 42, 43.

¹ Dr. Harrison Allen : *An Analysis of the Life Form in Art*, p. 37 (Philadelphia, 1875); A. P. Maudslay : *Biol. Cent. Amer. Archaeology*, Part II, plate 23, etc.

No. 2 is the "medicine rattle." Sometimes it was a gourd, at others of earthenware, as we see by the "pottery decoration" in Cod. Tro., 34, 35, etc. Sometimes it looks like a fan or a mirror.¹

No. 3 is the hatchet, and No. 4 the chisel. The peculiar shape and mode of use of the latter are seen Cod. Tro., 34, etc. Both of these implements were made of metal obtained from Tabasco, and Landa especially says that the latter was that with which they carved their idols, exactly as we see in the MSS.²

The word for the tomahawk in Maya was *bat*; and from the same root come *batul*, "to fight;" *batab*, "a chief;" *batan*, "first or in front of;" *bat*, "hail;" for any of which ideas the weapon might be a symbol or a rebus. It is of frequent occurrence in the texts. One of its uses, I am persuaded, was to indicate a thunderbolt or stroke of lightning. The name for this in Maya was "the blow of the cloud,"³ and in the group of the *moan* sign and the tomahawk we have this well expressed.

The first design in Fig. 60 shows the aspersorium, *lilābal*, with which the high priest sprinkled the holy water (which was the dew collected in the early morning) during the ceremonies. To it were attached the rattles of the rattlesnake and tails of

¹ Mr. E. P. Dieseldorff, in a description of a very beautiful decorated vase from the vale of Chamá, Guatemala, says that fans were not in use among the natives, and that the object in the paintings usually identified as such is a "soplador," or fire-blower, made of woven palm leaves, and still found in every house. *Verhand. der Berliner Anthropol. Gesell.*, 1894, p. 374.

² "Tenian cierto azofar blando y con alguna poca mezcla de oro, de que hazian las hachuelas de fundicion y unos cascabelejos con que vaylavan y una cierta manera de escoplillos con que hazian los idolos." *Relacion de Yucatan*, p. 107. (Madrid edition.)

³ *U hadz muyal*, literally, "its blow, the cloud." Another figure which seems to indicate the same is the broad, pointed object seen in the hands of deities. Cod. Cort., p. 28; Cod. Tro., pp. 29, 30, 38, 39. It is the same as the Nahuatl *tlauite-quiliztli*, portrayed in the hands of Tlaloc, in plate 70, of Boban's *Catalogue Raisonné* of the Goupil collection.

poisonous serpents.¹ It is often portrayed in the Codices and inscriptions.

The second design is the throwing-stick, in Nahuatl, *atlatl*. The admirable monograph of Mrs. Zelia Nuttall explains its important symbolic uses.² Examples where it is well portrayed are: Cod. Dres., p. 60, 65; Cod. Tro., pp. 21* and 22*.

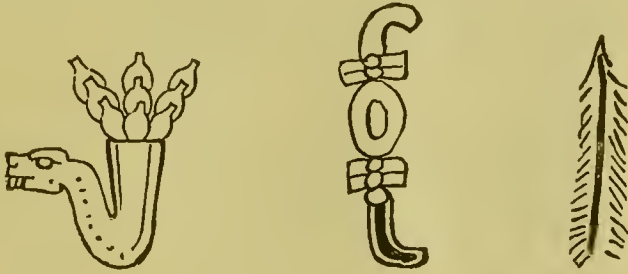


FIG. 60.—The Aspersorium, the Atlatl, and the Mimosa.

The third design in Fig. 60 is what Seler calls a broom (Spanish, *escobilla*, Nahuatl, *mallinalli*,) and Schellhas, a feather. But that it is, as Brasseur said, a mimosa, seems clear from Cod. Tro., p. 29, where it is shown growing. In id., p. 32*, where it is above the turtle, it has an astronomic significance.

Other objects sometimes depicted are fans, *ual* or *picit*; mirrors, *nen*; shields, *chimal*; and planting sticks, *xul*.

The designs shown in Fig. 61 recur in all the Codices, and I agree with Dr. Förstemann that they must refer to the celestial bodies and their relative motions (contrary to the view of Dr. Seler). That they have not all been identified is perhaps because none of the students of the subject has been astronomer enough to understand the lessons they convey.

A few we are certain about. No. 1 is the sun, No. 2 the moon; No. 13 must be "the rope of the moon" (see above p. 36)

¹ The name is from *lil*, to sprinkle, *haa*, water, and *bal*, the instrumental termination. The *Relacion de la Villa de Valladolid*, 1579, cap. xiv, says: "el ahkin llevaba un hisopo, atado en el muchas colas de vibora y culebras ponzoñosas."

² The *Atlatl or Spear Thrower of the Ancient Mexicans*. By Zelia Nuttall (Cambridge, Mass., 1891).

indicating its conjunction;¹ No. 12, from the Cod. Peres., might reasonably indicate its opposition; No. 14 is the pole star, occurring in Cod. Tro., pp. 20, 22, 23. Dr. Förstemann has offered certain reasons, reaching a moderate probability, that Nos. 3 and 4 symbolize the planet Mercury; Nos. 5 and 6 the planet Venus; No. 7, Jupiter; No. 8, Mars; and No. 11, Saturn; No. 15 I have seen only on the casts from Sastanquiqui, Peten, at the World's Columbian Exposition.

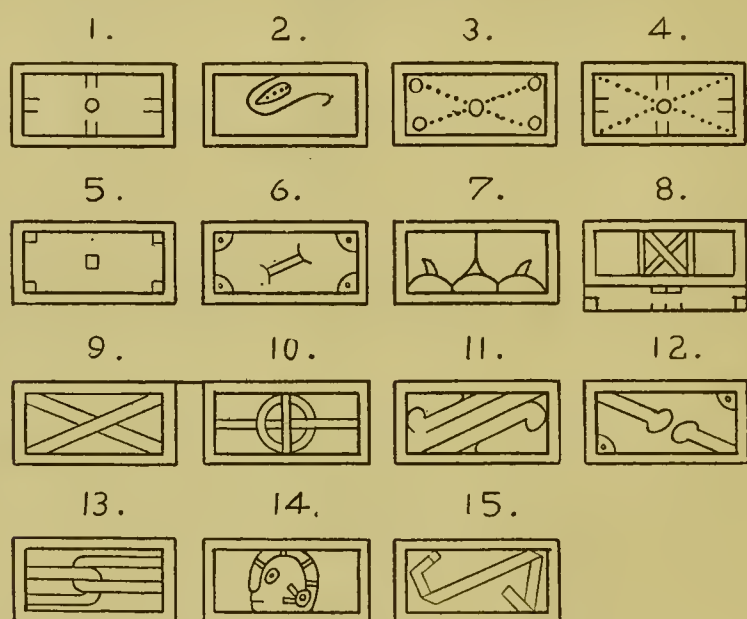


FIG. 61.—The "Constellation Band."

These designs are arranged in rows of three or more, forming ribbons or bands, and therefore I shall refer to the series as "the constellation band." Some members of it usually are placed above the representation of the sun and moon (day and night), frequent in the Codices and represented in Fig. 62.

¹ See Cod. Dres., p. 50. Precisely the same design recurs in the (Mexican) Codex Borgia, published in Kingsborough's *Mexican Antiquities*. No. 11 is also a Mexican calendar sign (Gama).

This has been called "the heavenly shield," a designation I shall retain. Its signification was first explained by Schellhas. The orbs are suspended from the "constellation band" by curi-

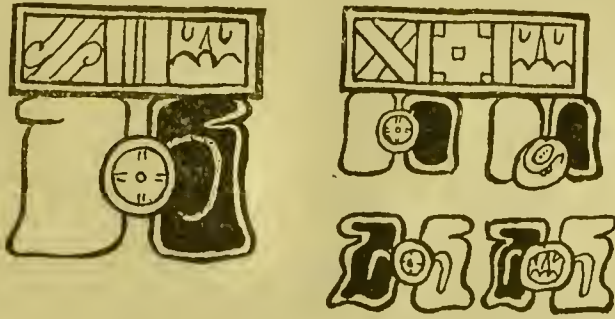


FIG. 62.—The "Heavenly Shield."

ous bearings, which seem to be developments from a form very common in the Mexican MSS., and which is shown in Fig. 63, No. 1, which, however, I have copied from a potsherd brought from Copan. Figs. Nos. 2 and 3, from the same source, also seem of astronomical intent, though No. 3 may be a variant of the *ik* (comp. Cod. Dres., pp. 56, 57).

1. 2. 3.



FIG. 63.—Designs from Copan Potsherds.

After considerable discussion the signs for the cardinal points have been definitely determined to be as in Fig. 64, reading from left to right, East, North, West, South. The East sign is composed of the *kin* (sun) sign with the *ahan* as a superfix and the "claw" postfix; the North has the north star god's monogram with the lunar prefix; the West the *kin* sign with the *mach* as a superfix

(see p. 83) and the "claw" postfix; the South has the *yax* with the *mac* superfix and sometimes an augment. Space will not permit a further analysis of these important composites, but



FIG. 64.—The Signs for the Cardinal Points.

each is highly significant. These signs never occur isolated, but always together; where one is found, the others may confidently be looked for.

Another series of signs are intimately associated with these. They are shown Fig. 65, and read from left to right, South, East, North, West.



FIG. 65.—The "Directive Signs."

The precise purpose of these has remained obscure. Dr. Seler has suggested that they indicate the colors which were assigned to the four directions. This is true as far as it goes, but does not explain many of their uses. My own studies have led me to believe they are primarily "directive signs," intended to guide the learner in the use of the calendar wheel. This was somewhat intricate, made by the superposition of two surfaces, the lower marked with the cardinal points, etc., the upper, I take it, with these directive signs. That any quarter in the native astrology could be transferred into any other, explains why they are all

found with all the signs of the cardinal points.¹ My view is borne out by the Books of Chilan Balam. In this work the rotation of the time-periods is called *cuceb*, "the squirrel," and their beginning is marked with the Fig. 66. This is identical with several variants of the North "directive sign" above; and the reason it was called *cuceb* was that the verb *cucul* means "to move round and round" as they did their calendar wheels.



FIG. 66.—The "Cuceb."

These four directive signs occur repeatedly as affixes. They may be read, (1) ideographically: either as directions, south, east, north, west; or for colors, yellow, red, white, black; or, (2) ikonometrically: for the homonyms of the names of these colors, that is, for the other meanings of the color names. These are numerous. Thus, *kan*, yellow, also means "jewels, money, food, abundance, a rope, a hamac;" *chac*, red, may also signify "strong, water, rain, the rain god, a tempest;" *zac*, white, is also an intensive particle, "much, very," and is close to *zacal*, to weave, a web, and *zacan*, bread; while *ek*, black, may also be translated "dark, darkness, a star, dyewood, the fat of meat." The sign for the East, the flint knife, may as such have the values assigned above to that object (see p. 89). This, however, does not make the method so complicated as one may think, for in all rebus-writing we find the ordinary signs employed are limited to a few recognized meanings.

5. *The Hieroglyphs of the Days.*

In my work on "The Native Calendar of Central America" I pointed out that the hieroglyphs of the names of the days are to be looked upon as rebuses, and therefore do not tell us the

¹ I hesitated some time to assign the flint knife to the East, but believe the evidence is in its favor. As Chavero has pointed out (*Antigüedades Mexicanas*, p. xxxv), in Mexican symbolism, the *tecpatl* belongs decidedly to the West.

real meaning of the name given the day. They are merely the pictures of some familiar visible object or objects, the name of which has more or less similarity to the name of the day, and would serve by an ocular representation to recall it to mind. To repeat what I there said on this essential point: "It is quite misleading to seek the real meaning or derivation of a day-name or other word from the figure which represents it in the hieroglyphic writing. The latter usually stands for a word of an entirely different meaning, the only connection being a more or less similarity of sound."¹

It should be remembered, therefore, that some of these hieroglyphics of the day-names recur as independent characters with other than calendar significations.



1. *Kan*. The object represented is a polished stone, shell pendant, or bead, in Maya, *kan*. It was their circulating medium, and it stands for *money*, and all which that magic word conveys, —food, prosperity, abundance.² The dot or eye in the upper portion is the perforation by which it was strung on a cord. Others explain it as an eye (Seler); a tooth (Brasseur); a grain of maize (Schellhas).

¹ *The Native Calendar of Mexico and Central America*, p. 4 (Philadelphia, 1893).

² "*Kan* : cuzcas ò piedras que servian à los indios de moneda y de adorno al cuello." *Dicc. de Motul*. I owe this identification to my late friend, Dr. C. H. Berendt, a profound Maya scholar. Its correctness will be confirmed by examining Cod. Cort., p. 12, Cod. Dres., p. 48, etc. This circulating medium of the Mayas is mentioned in the *Relacion de Valladolid*, 1579, cap. 33. In purchasing a wife the expression was *ah coy kan*, "he who must pay *kans*," as these were the consideration. (*Dicc. Motul*.) Other meanings of *kan* are: yellow, and hence ripe fruit, the yolk of an egg, cooked maize, etc.; anything precious or valuable; a measure of length; a set task; a net, and to fish or hunt with one.

2. *Chicchan*. The allusive design to suggest the name is sup-



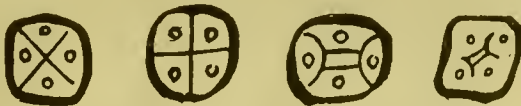
plied by the twisted threads *chich kuch*. See above, p. 96. Brasseur sees in it a petticoat, Seler a serpent's skin, etc.



3. *Cimi*. Represented either by an eye closed as in death, *cimil*; or by the maggot (see above p. 65).



4. *Manik*. Correctly explained by Brasseur as a hand in the act of grasping, "une main qui se ferme." Its phonetic value is not *kab*, hand, but *mach*, "to grasp" (see above p. 83).



5. *Lamat*. The figures bear a close resemblance to some of the sun signs. See Fig. 37. They seem to show the orb partly below a line—the horizon—which would give as a rebus *lamal kin*, the sunsetting; enough to recall the day name.



6. *Muluc*. The day sign *muluc* and the month sign *mol* have a resemblance, as do the words. The root *mol* or *mul* means a

coming together, or piling up. The hurricane is called *molay ik*, "the winds united;" the word for religion is *umolay*, literally, "a congregation or meeting." Both signs seem to portray one thing inside of another of the same kind, with a probable reference to the sense of the root.



7. *Oc*. Among its various meanings this word signifies "a trail" and "footprints." Such seems the design in the first variant. Brasseur, and, following him, Seler, think that the others portray the ears of a dog, as in some Mayan dialects the dog is called



FIG. 67.—A Cartouche.

oc. The full glyph is thus:



It is of frequent occurrence in such a cartouche as shown in Fig. 67, where *a* is the strengthened *pax*. (See p. 92), *b*, the dog sign; *c*, the haunch of venison; and *d*, the monogram of Xmucane with a vigesimal or personal prefix.

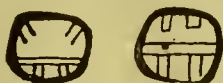


8. *Chuen*. The figure is that of a mouth, *chi*, with fangs; but as that was not very near in sound, a calabash, *chu*, is sometimes portrayed at the bottom of the circle, within. The mouth of no particular animal is intended, as is evident from allied designs; though Brasseur and Seler claim that it is of a monkey, Schellhas, of a snake, etc. The day name is close in sound to *chun*, the first, the beginning, and appears occasionally as a numeral (see above, p. 23). Piles of *chuen* are shown as offerings, e.g.,

Cod. Dres., pp. 26, 42; Cod. Cort., p. 3. Do they mean "first fruits?"¹



9. *Eb*. The face of an old man with a peculiar pointed ear mark. The word *eb* means "ladder;" *ebtun*, a stone stairway; *ebzah*, to sharpen or point a flint; this last may explain the sharpened ear and dots.



10. *Ben*, or *Been*. Explained by Brasseur as showing a path, *be*; by Seler, as a mat and a straw roof. To me, it looks like a *be che*, a wooden bridge, the two supports of which are shown and which was sometimes covered with a straw mat. This rebus gives the first syllable of the name. In Tzental tradition *Been* was the ancient hero who erected the inscribed stelæ (piedras paradas) at Quixté, near Comitán,² which the natives still decorate at certain times with garlands of flowers, etc.³

11. *Ix*. The usual figure contains a number of black dots.

¹ Variants of the *chuen* are extremely frequent in the mural inscriptions, and its correct interpretation, therefore, highly important. As stated in the text, I believe they generally stand for *chun*, which means "the foundation, the beginning, the first, the cause." We find such expressions as *tu chun che*, "at the foot of the tree;" *tu chun uitz*, "at the base of the hill," etc. In Tzental, *chu* is the teat or mamma, *chunel*, to suck the teat. In many inscriptions the position of the *chun* is antithetic to the *pax*, the one indicating the beginning, the other the end of a series.

² Nuñez de la Vega, *Constituciones Diocesanas*, p. 10. The story was that Been inscribed his own name upon them. I have not ascertained that this locality has been examined by modern travelers. It might offer valuable material.

³ E. Pineda, *Descripcion Geografica de Chiapas*, pp. 7, 8.

These suggest the word *xix*, scattered grain husks. Seler thinks it shows "the round hairy ear and spotted skin of the jaguar."



Brasseur proposed that it conventionally portrays the feminine parts, as *ix* is the feminine prefix in Maya.



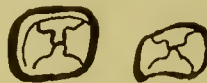
12. *Men*. The head of an aged person, supposed by Brasseur and Seler to be Mother Earth. Sometimes it is extended worm-like, as in Fig. 43, No. 3.



13. *Cib*. Brasseur and Seler believe the enclosed spiral represents the fermented liquor, *ci*, trickling down. The "pottery decoration" (see p. 58) certainly indicates a jar or vase.



14. *Caban*. The design is that of the "cork-screw curl" of a woman, and stands for *cab* (see p. 99).

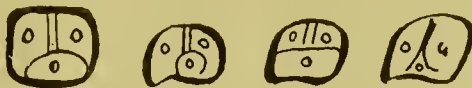


15. *Ezanab*. The picture is of the sacrificial knife of flint, which closely corresponds with the name.

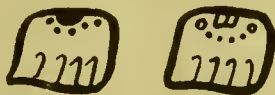
16. *Cauac*. The design shows a side face, with pendent clouds for the eye, the "windcross" for the ear, and, perhaps,



as Seler thinks, the hairy mouth of the *moan* bird. On the other hand, Rosny explains it as "the plan of a building," and Thomas as "the sign for wood."



17. *Ahau*. Usually considered to be the conventional drawing of a full face.



18. *Imix*. Generally regarded as representing a mammary gland, though it is not quite like those shown in the Codices. It is typical of prosperity and is often attached to the *kan* sign. In the calendar it indicated the beginning of a time-period.¹



19. *Ik*. The word means air, wind, breath, spirit, soul, and life. The design is a katun enclosing the sign of the four directions or four winds, the "wind-cross." Brasseur calls it a flower, because it is sometimes shown with what looks like leaves emerging from it (Cod Tro., pp. 5*, 6*, etc.). This indicates, however, the spirit of life coming forth (or, as Seler thinks, is a sign of

¹ See Förstemann, *Entzifferung*, IV, S. 15.

sacrifice; the same superfix occurs on the *kan*, Cod. Cort., p. 37, etc.).



20. *Akbal*. The word resembles *akab*, night, and is probably derived from it. The design may be that of a mouth with teeth (Brasseur, Seler), or the rays of the sun after sinking below the horizon. As a general glyph it is frequent with the signification of night and darkness, not necessarily in a bad sense.

6. *The Hieroglyphs for the Months.*

These are more intricate than those of the days, and show wider variation. In the designs given below, the first on the line is from Landa's work, the second and third are from the Dresden Codex.



1. *Pop*. The word means "a mat." The principal element in the glyph is the south or yellow sign, referring perhaps to the color of a mat, with the alar suffix. The prefix to the first variant shows the "windcross."



2. *Uo*. The usual meaning of this term is a prickly pear; also, a species of frog; *uoo*, a written character or letter. The prefix indicating speech (see p. 98) seems to indicate the latter. The chief element is the *mol* sign with the night sun as a subfix.

3. *Zip*. The design shows the sun below the flint knife, that is, the slain or departed sun, a play on the phrase, *zipik kin*, the



sun set (ponerse el sol, *Dicc. Motul*). The idea is strengthened by the *mac* as a prefix, signifying "to extinguish."



4. *Zodz*. The word means "bat," and the design shows the head of one with the *kin* as a superfix.



5. *Zec*, or *Tzec*. The design is explained by Brasseur as a death's head, Maya, *tzekel*; by others, as an open mouth with teeth (compare *chuen*, p. 112). The projecting curved lines above the head are supposed by Schellhas to represent a peculiar mode of wearing the hair. But as *tzec* means "scorpion," they may depict conventionally the claws of that animal.¹



6. *Xul*. The three signs are quite unlike. The first presents

¹ Seler observes, on doubtful premises,—“*Tzec* scheint der Zermalmer zu bedeuten.”

the conical bill of a bird of the finch or sparrow family; the second, the horned owl or the falcon (?); the third, a conventionalized bird's head. The second may be ikonomatic for *xulub*, horns. The word *xul* means to end or to finish; and, the end, limit, or extremity.



7. *Yaxkin*. This means "new sun" or "strong sun." The glyph expresses this by the *yax* sign, "new" or "strong;" the *kin* (sun) sign and the dotted postfix, *ual*, month. According to the Dicc. Motul, the phrase *dze yax kin* was applied by the Mayas to the hottest part of the summer.



8. *Mol*. See remarks on the day sign *muluc*, p. 111. Dr. Förstemann suggests that the above designs represent either (1) a snail in its shell, or (2) an egg with its yolk, or (3) the sun after setting. Seler holds that it shows the heart, Maya, *ol*, within the body, making a rebus for *mol*.



9. *Ch'en*. This means a spring or well of water. The second sign shows a water jar bearing the sign of fluid, with reference to the sense of the word. The first is more complex. The main element is a face with a *moan* mouth, referring to water; for an eye the infix *u*, for month; and two prefixes, the sign of

union (see p. 100), and above it what may be a variant of *ben* (see p. 113).



10. *Yax*. The feather sign *yax* (see p. 94) is the superfix to the *cauac* sign, which carries the postfix *ual*, month.



11. *Zac*. This word means "white," and this is here expressed by the *cauac* sign carrying as a superfix the north directive sign (see p. 109), as white was the color sacred to the North.



12. *Ceh*. The meaning of *ceh* is "deer," and the design shows the flint knife used in slaughtering that animal, placed as a superfix to the *cauac* sign.



13. *Mac*. The first glyph represents the cover of a jar, the name of which in Maya is *mac*, thus making a perfect rebus.¹ The second, not plain, is a variant of the *kan* or *imix*, with the

¹ "Mac, tapa de vasiija." The opinion of Allen that the sign represents the extended arms, the "great span," is inappropriate. The measure called *mac* was much greater (doce brazas, Pio Perez). Another meaning of *mac* is the sea turtle and its shell (galapago y concha del).

"comb" subfix. In this month was celebrated the important rite of *tupp kak*, "the extinguishing of the fire," the aim of which was to secure rain for the growing crops. The figure may refer to this.



14. *Kan kin*. This expression means "the yellow sun." The first glyph is a perfect rebus, showing the sun sign, *kin*, and the south directive sign (see Fig. 65), which means "yellow." The second glyph is the sign for a breast-bone, a shield, or dog (see p. 125).



15. *Muan*. The head of the *muan* bird, the crested falcon, with his ears or horns, see p. 74.



16. *Pax*. The only or main element is the drum, *pax che*, above explained (see p. 91).



17. *Kayab*. The main element was recognized by Schellhas as the head of a turtle. In Landa's alphabet this has the value

a or *ak*. It is applied as a rebus to recall the first syllable of the name.

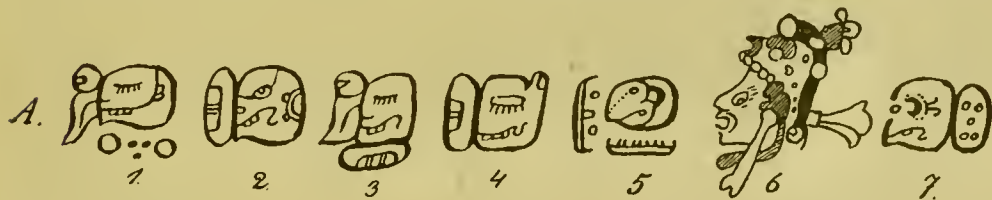


18. *Cum ku*. The glyph in one case combines *kan* and *cum*, with prefixes of *cauac* and *cib*. Dr. Förstemann fancifully explains it as portraying "from one point two flashes of lightning or sun's rays striking the maize field." Rather, we have here the rebus *cum kan*, recalling the name, and the *cauac* sign, which is repeated in a number of the month signs.

7. *The Hieroglyphs of the Deities.*

I have already mentioned that in the texts the gods are severally represented by their signs or monograms. The credit of defining these in a clear and satisfactory manner is due almost entirely to Dr. Schellhas, and I shall here present the results of his careful studies, retaining his alphabetic nomenclature, which has in some degree been accepted by Dr. Förstemann and others.

A. The god of Death.



His signs are clearly established and vary but little, Nos. 1-4. Two of them are usually written. The prefix to 1 and 3 has been already referred to (see p. 84). The bean (or flint) appears as a prefix in No. 2, as a subfix in No. 3. Frequently associated with his monogram is No. 5, which Seler explains as the sign of the owl. No. 6, from Cod. Dres., p. 50, with a skull

for a head-dress, may be a priest of the divinity; No. 7, from Dres., p. 22, may also be a priest or a companion.

B. Itzamna, or "the god with the snake-like tongue."



His hieroglyphs are, beyond mistake, Nos. 8 and 9. The directive sign, No. 10, is occasionally associated with his monogram. In Cod. Dres., p. 33, one of his attributes is shown in No. 11, the hand closing on the rattles of the crotalus. The food symbols, Nos. 12, 13, 14, 15, are often connected with him. Some regard them as the four elements, etc.

C. The North Star, or "the god with the ornamental face."



It is easy to recognize his monogram, Nos. 16, 17, 18, 19, 21. I have already explained the "pottery decoration" (above, p. 58). As prefixes, we find the bean, No. 20; the crescent, as in 21; the number 13, indicating completeness or perfection; and the vase, as in 16 and 17.

D. Cuculcan, "the moon god, or night god."



The complete hieroglyph is No. 22, generally followed by No. 23. He is "the old man god," with one tooth, as in No. 24;

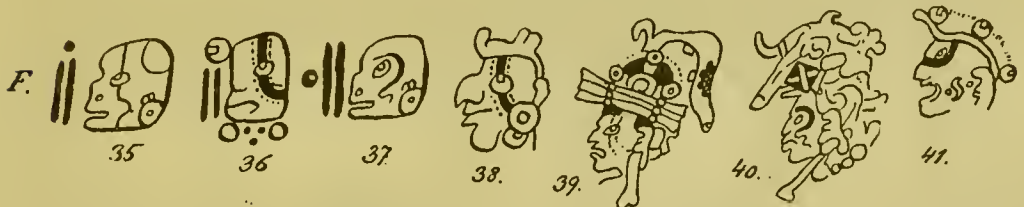
sometimes connected with the moon symbol as in No. 25; and often holds in his hand the aspersorium, shown in Nos. 26 and 27. See p. 105.

E. Ghanan, "a male maize god."



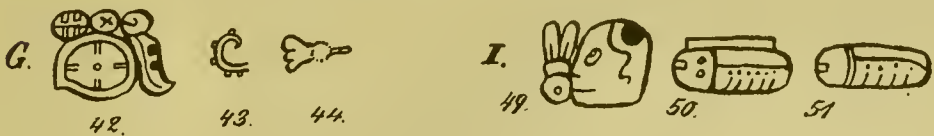
His usual monogram is No. 28. No. 29 is a picture of the maize plant from Cod. Tro., p. 29, from which Dr. Schellhas argues that the head-dresses of this divinity, as shown in Nos. 30-34, are conventional designs for growing maize. My own collations persuade me that the maize should here be understood as a general symbol for vegetable growth, fertility, and the harvests.

F. The god of War, or, "a companion of the god of death."



His hieroglyphs, shown in Nos. 35-41, often contain the number 11. The black line is characteristic. His signs appear in connection with all four cardinal points.

G. Kin ich, "the sun god."



His monogram is uniform No. 42. It is the sun with the *ben ik* superfix and alar postfix. (See p. 90). His nose orna-

ment, No. 43, and the "flower," No. 44, are usually distinctive of his portraits.¹

I. "The serpent goddess."

Her signs are not distinct. Dr. Schellhas believes them to be Nos. 49-51; but I cannot accept that they are intended for the same individual.

H. "The serpent god."

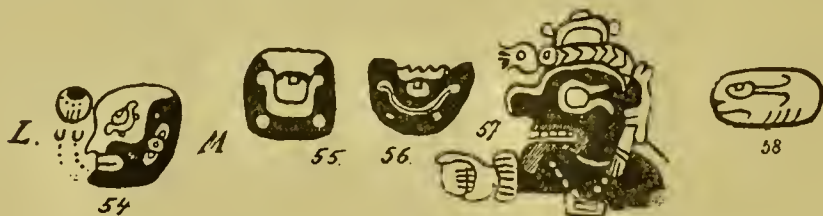


The hieroglyph and the personage, No. 45, are doubtful. He is supposed to be shown in Cod. Dres., pp. 11, 12, 20, etc. Nos. 46 and 47, from Cod. Tro., p. 17, are also assigned him. The rattle, No. 48, appears as a hieroglyph in Cod. Dres., p. 61, and elsewhere. I doubt this deity.

K. "The god with the ornamented nose."

The hieroglyph is No. 52, often accompanied by the "dog" sign, No. 53. I have already expressed the belief that this is merely one of the manifestations of Itzamna. (See p. 54.)

L. Ical Ahau, "a black god."

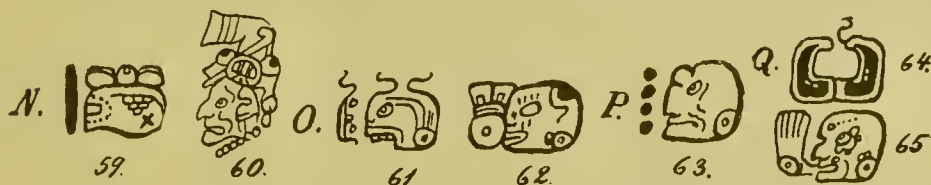


Dr. Schellhas distinguishes between a divinity whose sign is No. 54, and "*M*," "a second black god," whose hieroglyph is

¹ Dr. Seler, in *Zeitschrift für Ethnologie*, 1891, p. 111, gives another monogram for Kin ich—the *cauac*, with the "blowing" prefix (see p. 98) and the "machete" suffix.

No. 55, 56, and whose face is shown No. 57. He appears in Cod. Dres., pp. 13, 16, 43, and is common in the Cod. Tro. The sign No. 58 is occasionally associated, as in Cod. Tro., p. 5, and Cod. Cort., p. 28.

N. "A god with the features of an old man."



His sign is No. 59, which may be translated "5 Zac," and may refer to his festival on that date (Seler). His face and peculiar head-dress, with the *pax* sign, are shown No. 60. These do not strike me as representing divinity, but simply "old age."

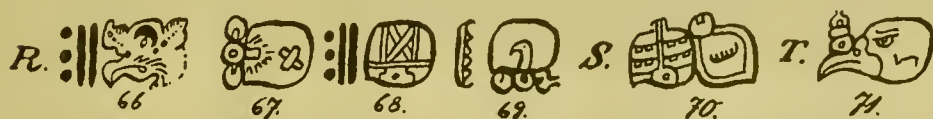
O. "A goddess with features of an old woman" (Xmucane?). Her hieroglyphs are shown Nos. 61, 62; the latter is more frequent.

P. "A figure with features of an old man."

It is seen Cod. Dres., p. 21, with the sign No. 63. It is doubtful if a deity is intended.

Q. "An isolated deity."

Shown Cod. Dres., p. 20, with the signs Nos. 64 and 65; probably a mere personage.

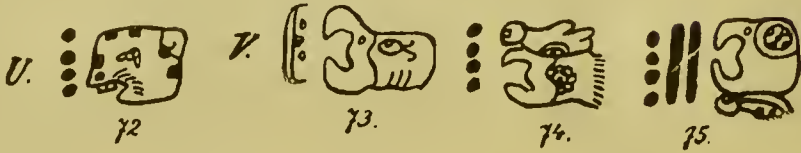


R. The *moan* bird.

He is often associated with the god of death, and bears the hieroglyphs Nos. 66-69, sometimes with the 13.

S. No. 70 is the usual hieroglyph of the dog, and *T*, No. 71, is that of the vulture.

U. No. 72 is the sign of the jaguar, as seen in Cod. Tro., p. 17, and in Cod. Dres., pp. 8, 26.



V. The turtle or tortoise. Its monogram is seen Nos. 73, 74, 75. It is the *a* of Landa's alphabet. There is no doubt but that the turtle's head and not that of the parrot is intended, though some have thought otherwise.

V. Specimens of Texts.

In the selection of the following texts I have been guided principally by the desire to illustrate Mayan palæography as presented on different surfaces, paper, stone, earthenware, etc., and as it is found in the various regions occupied by tribes of Mayan culture and affinity. Some of the examples have not been previously published, and for this reason have a special value.



FIG. 68.—The God of Time brings in the Dead Year. (From the Dresden Codex.)

Fig. 68 I would explain as the god of time bringing in the dead year. It is part of the ceremonies depicted as belonging to the close of the year. That the wolf-headed figure represents time, the Devourer, I infer from its relations in the early pages of the Ferjevary Codex, where it is shown eating a string of days, etc. (in Kingsborough's *Mexican Antiquities*).

These ceremonies are represented in the Cod. Troano, pp. 20-23, and the Cod. Dres., pp. 25-28. The recognition of their significance is principally due to Prof. Cyrus Thomas.

The god arrives in the vase of the heavenly waters. In his left hand he holds the rattle, in his right the magic wand, or magician's staff, *caluac*, and the medicine bag (Maya *chimil*, Nahuatl, *xiquipilli*); around his waist is the broad carrying-band, in the loop of which he has the dying year, *kan*.

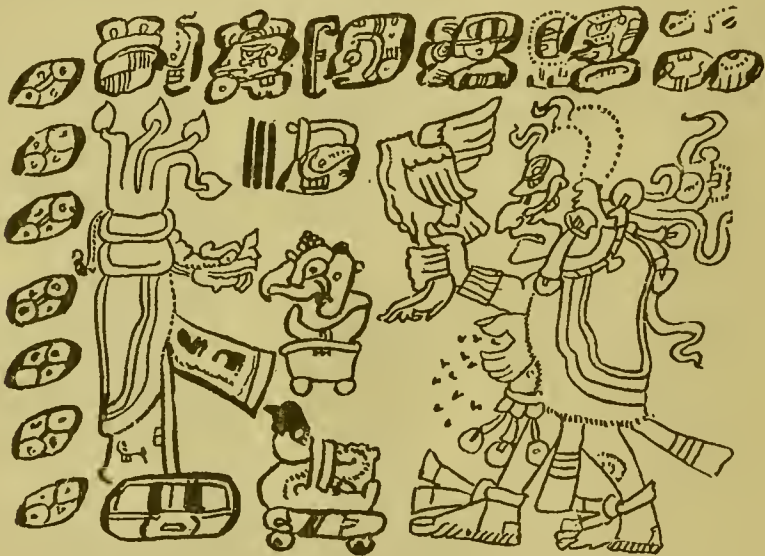


FIG. 69.—A Sacrifice at the Close of the Year. (From the Dresden Codex.)

In Fig. 69 is another scene from the same ceremonies. The person on the right is the celebrant, holding a beheaded fowl in his right hand, while his left strews grain. Before him is a haunch of venison and a turkey. Above the latter is the moon symbol with the number 15. To the left of these stands the statue of Mam, the Grandfather, a log folded in a robe and surmounted by the leaves of the Tree of Life.¹ In front are seen the serpent's head, the sign of Time; below this are footprints,

¹ See Cogolludo: *Historia de Yucatan*, Tom. I, p. 317.

to indicate that time is gone ; and beneath the form of the god is the sign *pax*, with the meaning, " it is ended."

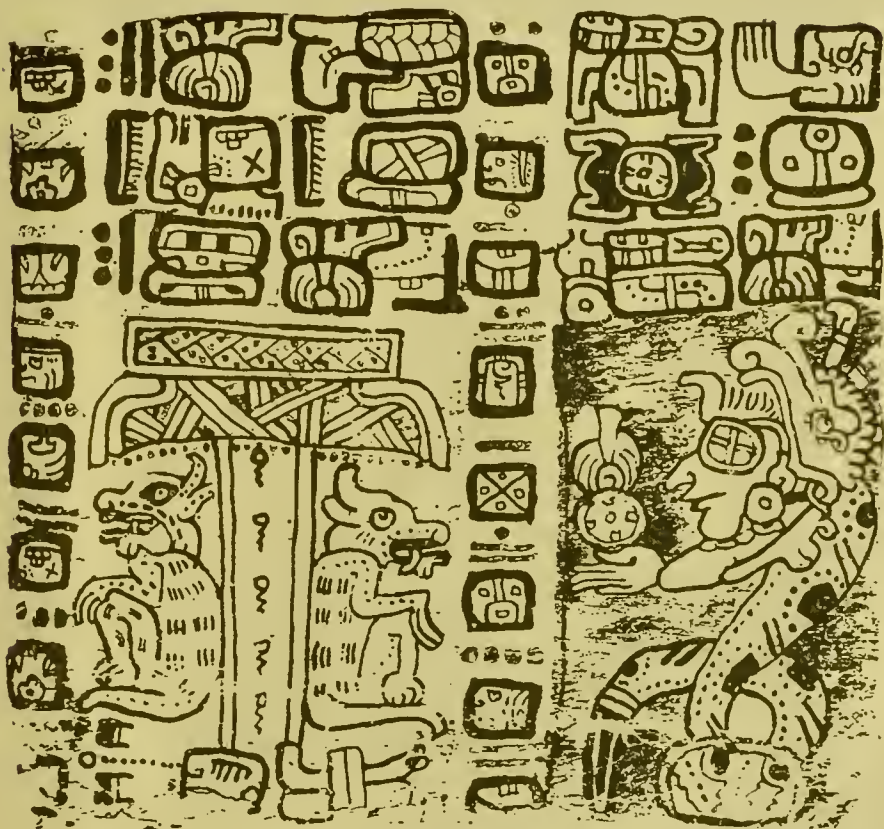


FIG. 70.—Symbolic Representation of the Close of one Time-Period and the Beginning of another. (From the Cortesian Codex.)

In interesting contrast to these two is Fig. 70, showing the beginning of a time-period. On the left, two dogs, back to back beneath the same canopy, indicate the closing of one period and the beginning of another. On the right, the serpent of time, resting on the earth, brings to the heavens the new sun. The youthful god between the serpent's jaws carries the world-sign for an eye, and holds in his hand the symbol *yax kin*, " new sun." Above are appropriate hieroglyphs, the tenor of which

the diligent student of my previous pages will have little difficulty in catching.

In Fig. 71 the God of Growth and Fertility holds an elaborate *caluac* surmounted by a bird, its apertures filled with shells. Behind him is seated the God of Death, his *caluac* tipped with a formidable spear-head. The God of Growth has not his own monogram, but that of the old Cuculcan.

When we recall that the shell is the sign for "nought," the indication seems that the God of Death with his spear will bring to nought the efforts of the God of Fertility.

We see in Fig. 72 the North Star in a series of relations to other celestial bodies or divinities. Beginning at the left, he is seated on his own sign which is surrounded by rays; next, he is upon the sign of the four winds and four quarters of the earth; in the third he is suspended in a sling from the "constellation band" between the sun and a planet; and fourth, he is above the clouds, which rest upon a canopy protecting a pile of *kans*, money or food emblems.

The three figures in Fig. 73 present the beneficent deities, each bearing in the hand the food symbol, *kan*.

The group copied in Fig. 74, show the God of Death followed by Kin ich, who seems remonstrating with him, who in turn is followed by the God of War with a wrathful visage. The positions of the hands are especially noteworthy. The sign *mol* leads each of the cartouches.

In Fig. 75 Cuculcan is making fire from the friction of two pieces of wood. On his head is the *moan* symbol, on his thigh the *kin*. Each of the three cartouches begins with the drum sign. His own monogram is the third member of the second cartouche.

In Fig. 76 the text is the same in each of the three cartouches except the monograms of the three divinities represented.



FIG. 71.—The God of Growth and the God of Death. (From the Cortesian Codex.)

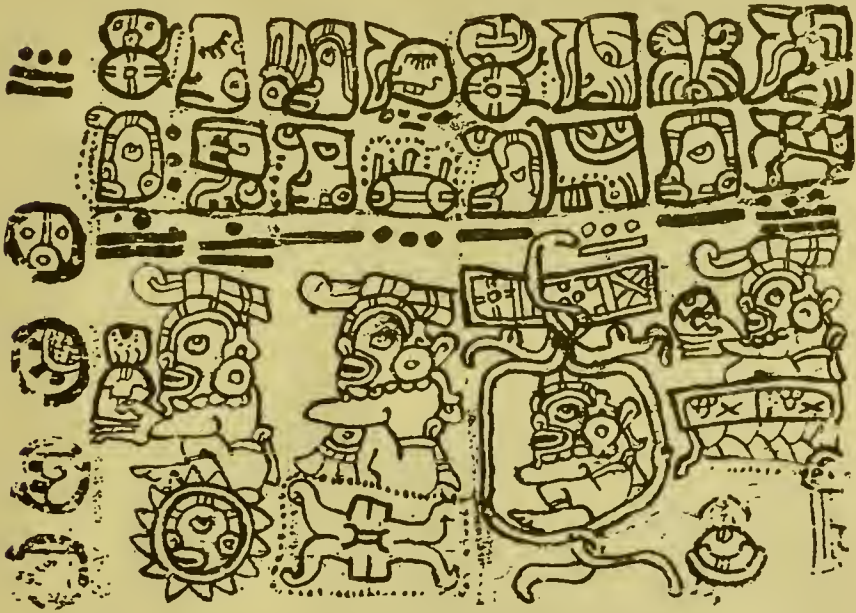


FIG. 72.—Auguries from the North Star. (Cortesian Codex.)

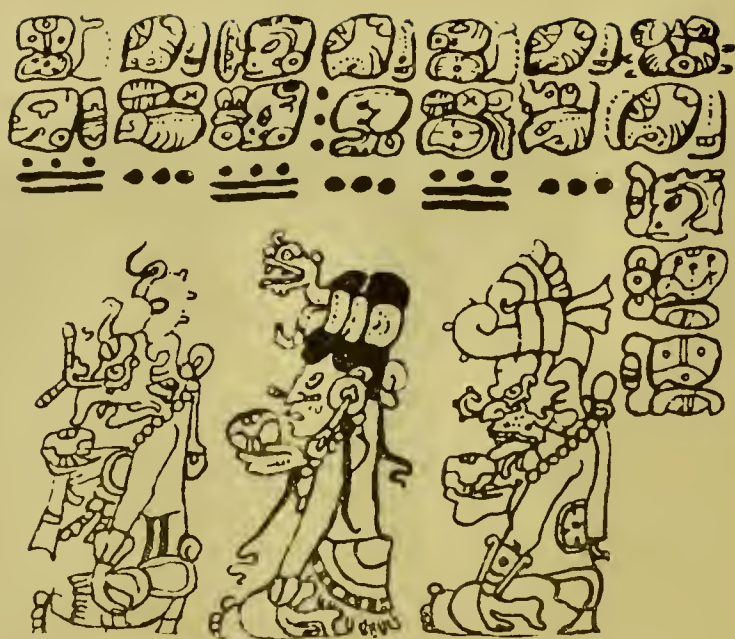


FIG. 73.—Itzamna, the Serpent Goddess, and Kin ich. (Dresden Codex.)



* FIG. 74.—The God of Death, Kin ich, and the God of War. (Dresden Codex.)

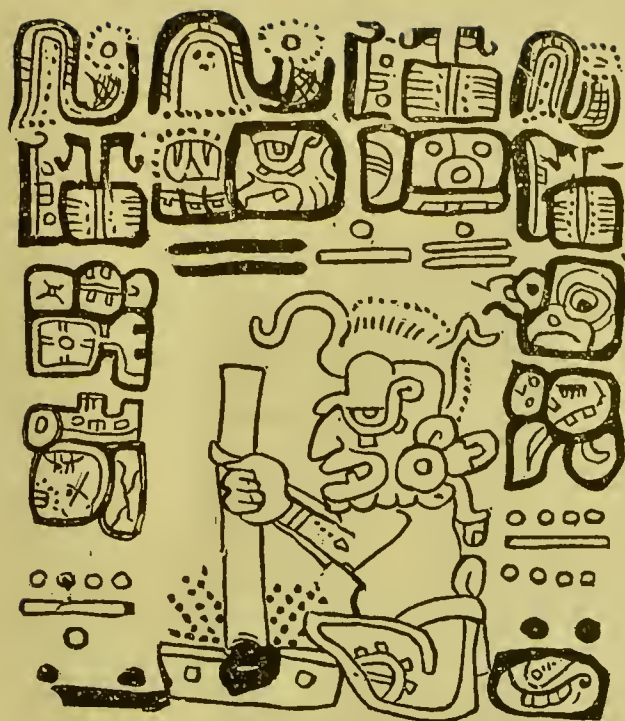


FIG. 75.—Cuculcan Makes New Fire. (Codex Troano.)



FIG. 76.—The Gods of Death, of Growth, and the North Star. (Dresden Codex).

In Fig. 77 each cartouche begins with *mol*, and is immediately followed by the monogram of the god. The lower glyphs differ materially.



FIG. 77.—The God of Growth, Kin ich, and Itzamna. (Dresden Codex.)

All the above specimens of texts have been photographed from the Codices, without restoration. They show, therefore, not only the general character of those documents, but also their state of preservation. In many instances the pages have been defaced, and portions of the inscriptions upon them injured. Sometimes it is possible to restore the obliterations by a comparison of parallel passages, and this has been done successfully by various scholars.

The extracts have been selected also with the object of showing the representations of the most prominent deities, Itzamna, Kin ich, Cuculcan, the God of Death, etc., in the manner in which we find them in the Codices.

In this interesting inscription from Central Yucatan, we recognize familiar signs, as the medicine-drum and the cloud-signs at the bottom, and *cauac*, *chikin*, *yax*, etc., within the

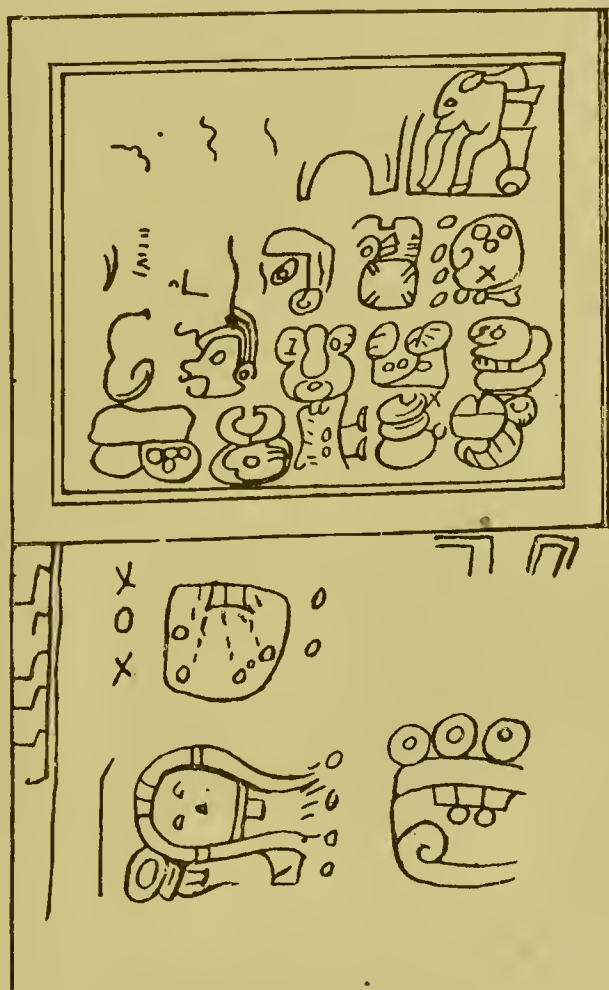


FIG. 78.—The Inscription of Kabah.

square area. It is sufficient to prove that at Kabah the same writing was in use.¹

¹ This inscription, painted on stucco, was copied by H. F. Becker and printed in the *Archives de la Société Américaine de France*. See de Rosny, *L'Interpretation des anciens Textes Mayas*, p. 12. note (Paris, 1875).

There is some reason to suppose, however, that in this part of the Mayan territory there had been a development of this writing until it had become conventionalized into a series of lines and small circles enclosed in the usual square or oval of the katun. I have seen several examples of this remarkable script, and give one, Fig. 79, part of an inscription on a vase from Labna, Yucatan, now in the Peabody Museum.¹

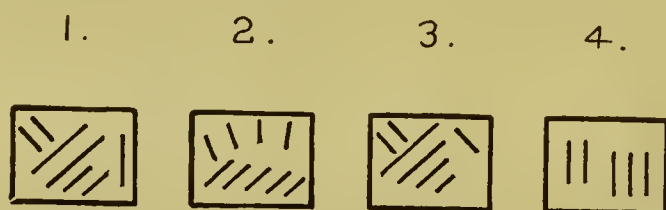


FIG. 79.—Linear Inscription from Yucatan.

The tablets at Palenque are too extensive a study for me to enter upon in the present work. The engraving, Fig. 80, is merely to show the character of the writing and to present the "initial glyphs," upon which, in Copan and elsewhere, Mr. Maudslay lays so much stress (see above, p. 23).

Incidentally, they seem to me to prove that the proper reading of the tablet is to begin at the top of the two right-hand columns, read them together downward (as Thomas suggested), then the next two to the left in a similar manner; but the last two on the left, those headed by the great *pax*, should be read from below upward. This differs from any scheme yet proposed, but alone corresponds with the natural sequences of the groups of glyphs. The terminal (upper left) glyph shows the *pax* surmounted by the *xihuitl* and this by the "trinal" signs. The student of the preceding pages will not be at a loss to explain their purport.

¹ Another example is in the Thompson collection, and a third, somewhat similar, also from a vase from Yucatan (now in Berlin), has been published by Dr. Schellhas, *Internat. Archiv. für Ethnographie*, 1890 (p. 3 of his separatum).

I have already referred (above, p. 54) to the singular "bas-reliefs of Chiapas." They are covered with elaborate designs



FIG. 80.—The "Initial Series" of the Tablet of the Cross, Palenque.

carved in low relief on the argillaceous slate of which they consist. Nearly all have hieroglyphics of a decorative Mayan character. For the sake of comparison I add Fig. 81, a tracing of

the four glyphs which are placed in front of the tapir on the "tapir tablet."

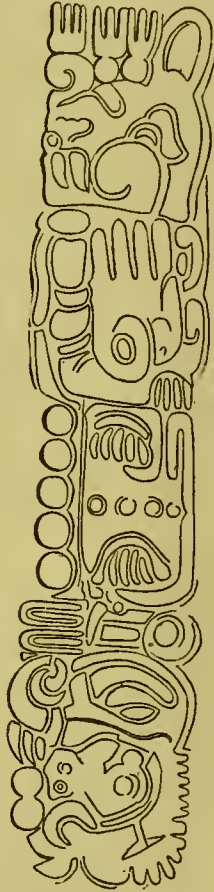
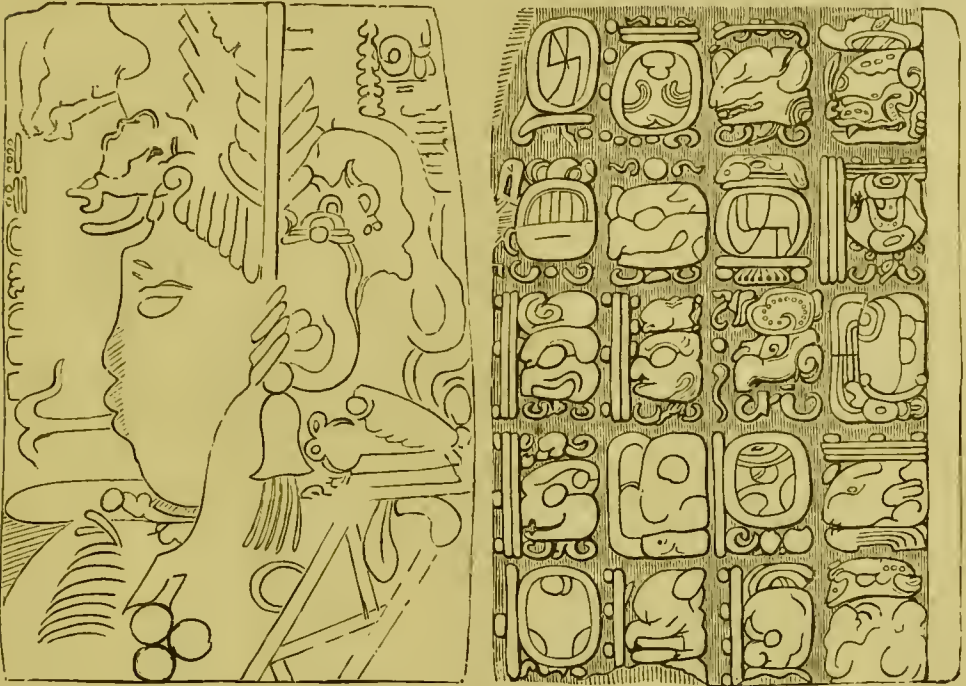


FIG. 81.—Inscription on the "Tapir Tablet," Chiapas.

The interesting group, Fig. 82, is the most complete example of the ancient writing I know of, from the region of the Zotzils. The original, formerly in the possession of Don Secundino Orantes, in the city of Chiapas, measures 26 by 17 inches. The front is badly injured, but the back well preserved. We find in this cartouche of twenty glyphs enough familiar forms to convince us of the identity of the graphic method. *Pax, chuen*, the iguana, etc., are soon recognized. The copy was made by the late Dr. C. H. Berendt.

Toniná is about 80 miles south of Palenque and near Ococingo, whence Mr. Squier obtained the amulet bearing the neat inscription-



Obverse.

Reverse.

FIG. 82.—Inscription on a Tablet from Toniná, Chiapas.

tion shown in Fig. 83. The original is now in the American Museum of Natural History, New York city.



FIG. 83.—Inscription on an Amulet from Ococingo, Chiapas.

The beautiful inscription, Fig. 84, hitherto unpublished, is on

a burial vase from the Quiche district of Guatemala, near Huehuetenango. It is not only the longest and most perfect example known of Quiche palæography, but it is also the most extensive inscription I have seen on pottery from any part of the

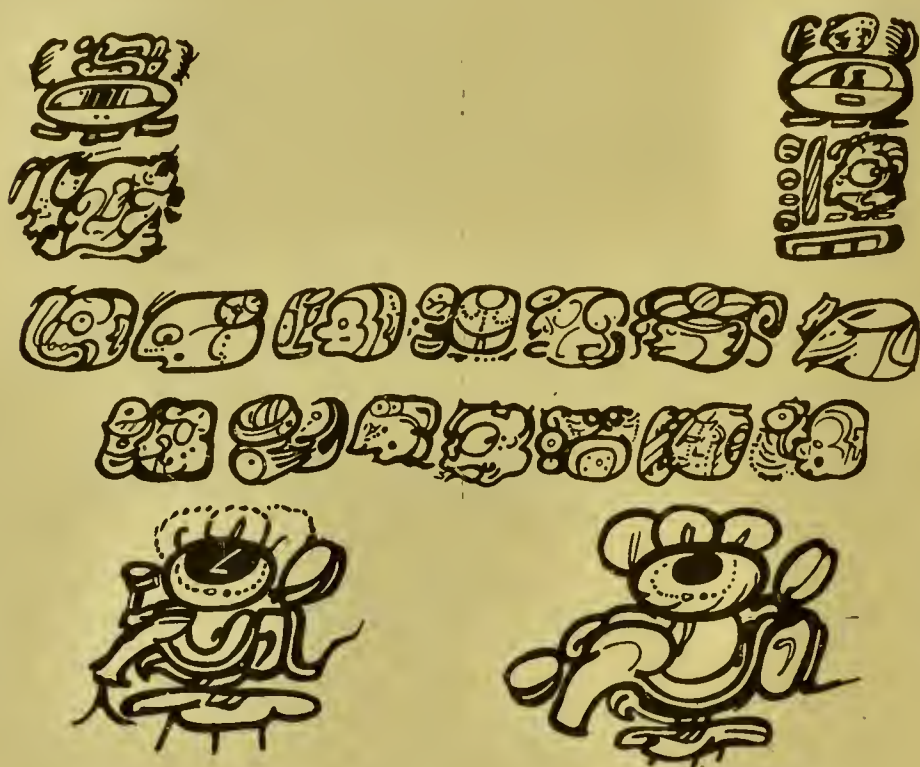


FIG. 84.—Inscription on a Vase from a Quiche Tomb, Guatemala.

Mayan territory. The original, a vase of high artistic merit, is in the Museum of the University of Pennsylvania. Again we see familiar signs, the *imix*, the *pax*, the numerals, the bean suffix, etc.

The limits which I have prescribed for this work do not permit me to add further comparisons in Mayan palæography. Fortunately, the student can find ready access to abundant examples. The inscriptions of Copan and Quiriguá, of Chichen

Itza, and Palenque, are or will be represented with admirable fidelity in Mr. Maudslay's work already referred to; others from Tikal have been made accessible by the labors of Berendt, Charnay and de Rosny; and we are justified in believing that before many years the intelligent explorations of competent archæologists will add hundreds of texts from the relics in stone, clay, and wood which still exist to attest the character of ancient Mayan literature.

The most urgent duty resting upon the present generation of students interested in this subject is to collect and accurately reproduce as many of these texts as possible, before they are destroyed or lost. Extended comparisons will ultimately reveal their meaning, as will readily be seen from the advances in that direction chronicled in the preceding pages.

I. INDEX-VOCABULARY OF MAYA WORDS.

(T. signifies the Tzental dialect.)

- ac*, a tortoise, or turtle, 35, 74
acan, mead, 42
ac ek, a constellation, 35
aghan, T., young ear of maize, 62
ahau, ruler, lord, 41; a day name, 115
ahau can, rattlesnake, 68, 75
ahau can mai, chief priest, 68
ahau katun, 22
ahau tzab can, the rattlesnake, 75
ah-caluac, the staff bearer, the mayordomo, 52
ah-ch'om, a vulture, 73
ah-chun can, high priest, 68
ah-coy-can, v. p. 110, note
ah-cunal than, word-conjurer, 68
ah-kin, priest, 68
ah-kin-mai, chief priest, 68
ah koh-keuel, a masked priest, 69
ahlo, the macaw, 73
ah-mac ik, wind-conjurer, 68
ah-poou, the milky way, 35
ah-pul, a conjurer, 68
ah-uai-chac, rain conjurer, 68
ah-uai xibalba, conjurer of departed souls, 68
ah-zahcab, Venus, 34
akbal, night, darkness, 56; a day name, 116
alau (64,000,000), 19
anhel, to stand erect, 46

bacab, 40
bac-baquetic, a numeral, 19
balam, the jaguar, 72
bak, four hundred, 19

bat, an axe; hail, 104
batab, a chief, 104
batul, to fight, 104
be, footprints, 88
be che, a bridge, 113
ben, or *been*, a day name, 91, 113
ben-ik, a graphic sign, 90, 123
bolon, nine, 25
bolon paxche, a large drum, 92
budz ek, a comet, 35
bul, a bean; all, the whole, 89
bulcabal, a destruction, 46

caan, the sky, 52
cab, down, downward, etc., 60, 99, 114
caban, a day name, 114
cac, to pull out, 86
calab (160,000), 19
calacal, perforated, 52
caluac, the "staff of office," 52, 128, 130
camach, a jaw bone, 85
canan, a sentinel, guardian, 34
canan chulchan, Venus, 34
can zicnal, serpent being, 41
cauac, a day name, 115
cayob, T., a drum, 93
ceh, a deer; a month name, 119
chaam, the (molar) teeth, 43
chac, red, strong; water, etc., 34, 40, 109
chac ek, Venus, 34
chacal ik, strong wind, 40
cham, a jaw bone, 85
chamal dzutan, shooting stars, 35
che, tree, wood, 45
chebel, to paint; a paint brush, 42

chel, the rainbow, 40
ch'en, a month name; a well, 118
chi, to bite, 89; a mouth, 112
chibil kin, a solar eclipse, 36
chibil u, a lunar eclipse, 36
chicchan, a day name, 111
chich, strong, powerful, swift, hard, 96
chich kuch, to twist thread, 96
chimal, shield, 34
chimal ek, the north star, 34
chimal ik, the north wind, 34
chimil, a medicine bag, 128
chinax, T., a knife, 89
chu, a calabash, 112
chuen, a day name, 23, 112
chulchan, the sky or heavens, 34
chun, the first, the beginning, 23, 113
ci, to trickle, 114
cib, a day name, 114
cicil, a knife, 84
cimi, a day name, 111
coz, an owl, 73
cuceb, a squirrel, 109
cucul, covered; revolving, 56, 109
culinte, T., a drum of wood, 93
cum, a vase, 41, 48
cum ku, a month name, 121
cun, to conjure, 44
cüzaan, or *cuzam*, a swallow, 42

dzacab, a generation, 25
dzacah, to heal by magic rites, 93
dzacatan, a medicine drum, 93
dzicnial, 39
dziŋ, to skin animals, 42
dziz, coolness, cold, 42

eb, a day name, 113
eb-che, a ladder, 77
eb-tun, a stone stairway, 113
ebzah, to sharpen, 113
ek, star; black, 34; dyewood, fat, 109
ek chuh, scorpion, 67
ezanab, a day name, 114

ghan, T., maize, 62

haycabal, a destruction, 46
hobnil, hollow; the belly, 40
hozan, disembowelled, 41
hub, a snail, 75
hun, one, 25
hunab, only, sole, 37
hunbalan u, the moon in conjunction, 36

ibach, an armadillo, 72
ical, or *ic*, T., black, 67
ich, an eye; a face; twins, 84
ik, wind, breath, life, soul, etc., 50, 115
ik, a day name, 91, 115
ik omne, a comet, 35
imix, a day name, 115
itz, fluid, 52
ix, feminine prefix, 40
ix-bouat, a prophetess, 68
ix chel, the rainbow, 40
ix-cunal than, a conjureess, 68
ix kan leom, a spider-web, 40
ix kin, priestess, 68
ix nuc, old woman, 43

kaax, a knot; a harvest-field, 41
kab, a hand, arm, finger, juice, sap, tears, 83
kaba, a name, 83
kabil, his hand, 38
kak, fire, 42, 120
kak mo, a bird, 39
kal, twenty, 19
kan, money, food, etc., 109
kan kin, a month name, 120
katun, 11, 22, 28
kax or *kaax*, a knot, 91
kax pol, the tress of the hair, 91
kaxala, to rain; the rain, 91
kayab, a month name, 120
kin katun, 28
kin,
*kin*al, } see p. 87
kinam, }

kinchil (3,200,000), 19
kin ich (deriv.), 39
koh, a mask, 69
ku, a god; divine, 37
kuch, a vulture, 46, 73
kul, divine, 95
ku kum, a feather, 95
kup, to sacrifice, to cut, 69

lakin chan (deriv.), 38
lamat, a day name, 111
licil dzicil, a knife, 89
lilabal, a sprinkler, 105
lom, a lance, 43
lum, the earth, 48

maax, a monkey, 72
mac, to extinguish; a cover; a turtle; a month name, 119
mach, to grasp, 83
mai or *maay*, dust, smoke, fume, 25, 68
mam, a numeral, 19; grandfather, 128
manik, a day name, 39, 111
matzab, antennæ, rays, 98
mechun, a numeral, 19
mehen ek, a constellation, 35
men, a day name, 114
miaz, a scholar, 25
moan, see *muan*
mol, a month name, 118
molay ik, a hurricane, 112
moo, the macaw, 73
moxic, T., a day name, 39
muan, a falcon, cloudy, 74; also, a month name, 120
muc, to cover, to bury, 61
much, a frog, 75
mucul canan, Venus, 34
mucul mam, a numeral, 19
mucul u, the waning moon, 61
muluc, a day name, 111
muyal, clouds, 48, 52, 74
muyan, see *muan*

nak caan, the sky, 99
na, a house, 37
nen, a mirror, 105
noh, great, strong; right hand, 34
noh ek, great star, 34
nohnial, 39
nuc, old, 43
nech, provisions, 42

oc, to enter; a day name, 112
ol, the soul or spirit, 48
oxlahun, thirteen, 25

paakal, to frighten, 44
pacat, face, 44
pax, a musical instrument, 92; a month name, 120
paxan, completed, finished, 92, 125, 129
pax che, a wooden drum, 92
pec, to rattle, to thunder, 63, 71
pec chac, thunder, 63
pech hec hol, flatheaded, 62
pek, a dog, 71
pic, eight thousand, 19
picit, a fan, 105
pixan, the soul, 25
pocam, a cleansing, 55
pop, a mat; a month name, 116
ppeta, to perform religious rites; to cry with pain, 69
ppua, dew, 42
pputum, small, 43
ppuz, bent over, 43
puch, to spoil, to undo, to destroy, 44
puhaa, to blow forth water from the mouth, 98
puy, a shell, 19

ta, a knife; excrement, 89
tah, a dramatic representation, 89
tab, cord, twenty, 19, 42
tamacaz, the milky way, 35
tan kukul, before the gods, 44

- tankul*, a drum, 93
tem, an altar of stone, 48
tixl (Cak.), the tapir, 55
tub, to spit, 42
tun, a stone, a jewel, 42
tunkul, see *tankul*
tup, to stop up, to extinguish; also, ear-rings, 85, 120
tupul u uich kin, a solar eclipse, 36
tzab, rattles of the rattle-snake; the Pleiades, 35, 63
tza ec, a comet, 35
tzapa, short, 43
tzec, a scorpion; a month name, 117
tzekel, a death's head, 117
tzimin, the tapir, 55
tzotzceh (3,200,000), 19
tzuc, a five-day period, 28

U, the moon; a necklace; his; 36, 86, 87
ua or *ual*, a dot, 97; a fan, 105
uac, six, 43
ual, month, 118
u nupptanba, the moon in opposition, 36
uil, food; advantageous, 86
uinal, month; twenty, 87
uinic, a man, 43, 87
uo, a frog, 75; a month name, 116
uook, a book; a letter, 116
ut, a snail, 75

xamach, a platter, 58
xaman, north, 34
xaman ek, the north star, 34
xanab xux, a bee, 60
xel, a comb, etc., 86
xicin, an ear; a shell, 85
xik, wing of a bird, 84

xikal, a queen, 84
xiix, bran, husks of grain, 97
xoc, to sing, to chant, 42
xoc, the breech clout, 91
xul, a planting stick, 105; to end; a month name, 117
xulab, an ant, 36
xulub, horns, 118
xux, a wasp, 60
xux ek, Venus, 60

yax, green; blue; fresh; strong; virile; early, 95; a month name, 119
yax che, green tree, 45, 48
yax kin, a month name, 118, 129
yax kukul, a feather ornament, 95
ye, to appear, to show oneself, 43
yetal, and, 100
yum, father, ruler, 41

zac, white, east, v. pp. 109, 110; a month name, 119
zacal, to weave, 109
zacan, bread, 109
zac ik, east wind, 41
zac nohol ik, southeast wind, 41
zac xaman ik, northeast wind, 41
zac zini, white being, 41
zaztal ek, Venus, 34
zec, a month name, 117
zin, to stretch out, 75
zinaan, a scorpion, 75
zinaan ek, a constellation, 75
zinil, the earth, 75
zip, a month name, 117
zipik kin, the sunset, 117
zodz, a bat; a month name, 117
zuhuy, a virgin, 42

II. INDEX OF AUTHORS.

- Aguilar, 26, 45
 Allen, H., 86, 95, 103, 119, etc.
 Baeza, P., 93
 Becker, H. F., 137
 Beltran de Santa Rosa, 44
 Berendt, C. H., 48, 74, 93, 110, 138
 Boas, F., 62
 Boban, E., 104
 Brasseur, Abbé, 13, 14, 15, 23, 51, 83, 86, 90, 112, etc.
 Carrillo, C., 62
 Charency, H. de, 12
 Charnay, D., 11, 143
 Chavero, A., 54, 79, 97, 109
 Chilán Balam, Books of, 46, 47, 109
 Clarke, W. P., 83
 Cresson, H. T., 13, 15
 Cogolludo, P., 39, 47, 51
 Culin, S., 24
 Cushing, F. H., 48
 Dieseldorff, E. P., 104
 Dupaix, C., 95
 Duran, D., 66, 92
 Fewkes, J. W., 41, 55, 57, 70
 Förstemann, E. W., 12, 13, 18, 29, 33, 74, etc.
 Hernandez, P. R., 37
 Herrera, A., 39
 Holden, E. S., 11, 13
 Kingsborough, Lord, 12, 95
 Landa, D. de, 14, 26, 35, 39, 43, 54, 68, 104, 116
 Lara, D., 60, 93
 Las Casas, B., 37
 Leon, M., 26
 Lizana, P., 37
 Mallery, G., 83, 99
 Maudslay, A. P., 11, 12, 21, 23, 102, 136
 Motul, Dicc., 37
 Nuñez, de la Vega, 25, 39, 62, 67, 68, 113
 Nuttall, Z., 26, 32, 105
 Orantes, S., 138
 Parry, F., 50
 Peet, S. D., 101
 Peñafiel, A., 97
 Perrin, P., 12
 Pineda, E., 113
 Pineda, V., 19
 Pio Perez, 41, 119
 Plongeon, Dr. Le, 11, 15, 95
 Popol Vuh, 48, 50, 61
 Pousse, A., 12, 21, 31, 79, 80, 101
 Putnam, F. W., 11
 Rada y Delgado, J. D., 14
 Rau, C., 13
 Rochefoucauld, F. A., 16
 Rosny, L. de, 12, 14, 85, 115, 137
 Saville, M. H., 92
 Schellhas, P., 12, 43, 50, 51, 62, 71, 81, 121, 136, etc.

- Schrader, Dr., 26
Schultz-Sellack, Dr., 41
Seler, E., 10, 25, 32, 43, 44, 45, 71, 83,
86, 124, etc.
Squier, E. G., 141
Stephens, J. L., 11
Stone, W., 72
Thomas, C., 13, 16, 24, 29, 32, 34, 50, 51,
76, 86, 128, etc.
Thompson, E. C., 136
Valentini, F., 86
Waldeck, F., 54
Ximenes, F., 50, 96

III. GENERAL INDEX.

- Acan, 42
 Acat, 43
 Ah chuy kak, 44
 cun can, 44
 dziz, 42
 kak nech, 42
 kin xoc, 42
 ppua, 42
 puch, 44, 64
 Ahulane, 44
 Ah zakik ual, 42
 Alphabets, of Landa, 14 ; of other writers,
 15-17
 Anum, the first man, 46
 Armadillo, the, 72
 Aspersorium, the, 105, 123
 Atlatl, the, 105

 Bacabs, the, 40
 Baptism, native, 76
 Baton of office, 52, 128, 130
 Bean symbol, 89, 121, 122
 sign, 89
 Beards, on images, 39, 57
 Bee god, the, 59-61, 98
 Bells, as ornaments, 64, 83
 Ben, or Been, myths of, 113
Ben-ik sign, 91, 123
 Birds, figures of, 72
 Bissextile years, 26
 Black gods, 66, 124

 Calendar signs, 22
 systems, 26-29
 Canopies, 96

 Canzicnal, 41
 Cardinal points, the, 40, 41, 108
 Centeotl, 62
 Ceremonial circuit, the, 41
 Chac mool, 95
 Chacs, the, 40
 Chamay bac, 44
 Chiapas, 37, 138
 Chichen Itza, 38
 Chilan Balam, Books of, 14, 19
 Cit bolon tun, 42
 Cloud balls, 98
 Codices, the, 11 ; as time-counts, 18
 Colors, symbolism of, 40, 41
 signs for, 109
 Comb sign, 86
 Comets, 35
 Conjurers, 68
 Constellation band, the, 106
 Copan, inscriptions, 21, 107, 136
 Corkscrew curl, 98
 Cosmic sign, the, 24, 50
 Cosmogony of Mayas, 46
 Cross hatching, 24, 96
 Cross, Tablet of, 62, 137
 Crotalean curve, 102
 Cuculcan, 38, 49, 55-57, 61
 Cum ahau, 41

 Days, hieroglyphs of, 159
 Death, god of, 44, 64, 121
 signs for, 84, 97
 Deers, 72, 119
 Directive signs, 88, 108

- Dogs, figures of, 71, 129
 signs for, 89, 95, 112, 125
 as food animals, 90
 Dots, their meanings, 97
 Drum signs, 91. See *pax*
 Dwarfs, 43

 Ear rings, 85
 Earth-goddess, the, 61, 64, 91, 95, 100
 Eclipses, 36
 Ek ahau, 66, 67
 chua, 42, 66, 67
 Epochs of the Universe, 46
 Evening Star, the, 61, 64
 Evil, gods of, 43
 Eye, signs for, 83-85

 Falcon, the crested, 74
 Fans, 104, 105
 Feather balls, 95
 signs, 84, 94
 Female divinities, 40-44
 Fish, 90
 "Fish and oyster" sign, 89
 Flatheads, 62
 Flint-knife, the, 88, 109
 Folk-lore of Yucatan, 43
 Food offerings, the, 90
 sign for, 86
 Frog, the, 75

 Gemini, 35
 Ghanan, 62, 123
 Gukumatz, 38, 61

 Hand, the, as deity, 38
 the closing, 102
 signs for, 82
 Hex chun chan, 44
 Hobnil, 40
 Holy water, 104
 House, signs for, 88
 Hozan ek, 41
 Huastecas, 10

 Hunab ku, 37
 Hun ahau, 44
 pic tok, 44

 Ical ahau, 67, 124
 Iguana, the, 90, 122
 Ikonomatic writing, 13, 82, 97
 "Initial series" of glyphs, 24, 92, 93, 136
 Itzamna, 37, 51-55, 101, 122, 124
 Ix chebel yax, 42
 chel, 40, 64
 hun yé, 43
 hun yeta, 43
 kan leom, 40
 nuc, 43
 tabai, 42
 tub tun, 42

 Jade, jewels of, 88
 Jaguar, the, 72, 126
 Jupiter, planet, 106

 Kabah, inscription of, 52, 135
 Kabil, 38, 51
 Kak u pacat, 44
 "Keys" to the hieroglyphs, 16, 17
 Kin ich, 39, 57, 123, 124
 ahau Itzamna, 40
K'in sign, the, 88
 Knife signs, 88, 109
 Knives, sacrificial, 89
 Knots, 100

 Labna, 136
 Lakin chan, 38, 51
 Life, symbol of, 49, 115
 tree of, 49, 53, 59, 62, 101, 128
 Lightning, symbols, 71, 74, 89, 104
 Lorillard City, 29
 Lunar years, 26

 Macaw, the, 73
 Machete, the, 102
 Maize god, the, 62, 123

- Mam, the god, 128
 Man, the first, 46
 signs for, 86, 97
 Mars, planet, 106
 Masks, use of, 54, 55
 Mayan, meaning of, 10
 Medicine drum, 93
 rattle, 104
 bag, 128
 Menche, 29
 Mercury, planet, 106
 Metals, use of, 104
 Mexican writing, 10, 79
 Mimosa, the, 105
 Mirrors, 104, 105
 Mitna, 44
 Mixcoatl, 39
 Milky Way, the, 35
Moan bird, the, 74, 125
 Money, the native, 110
 Monkey, the, 72
 Monograms of gods, 121
 Months, signs for, 88
 Moon, words for, 36
 signs for, 87
 Mother Earth, sign for, 91, 95, 100
 Mugerres, *Isla de*, 42

 Nagualism, 98
 Necklace, sign for, 86
 North Star, the, 34, 57-59
 Numbers, sacred and symbolic, 24, 25

 Ococingo, 139
 Orion, 35
 Owl, the, 73

 Pakoc, 44
 Palæography, Mayan, 127
 Palenque inscriptions, 13, 16, 21, 54, 62,
 95, 136, 137
 Pelican, the, 74
 Phallic emblems, 24, 90, 95
 Picture writing, 98

 Pleiades, the, 35, 63
 Pole star, the, 57-59
 Pottery decoration, 58, 122
 Ppiz lim tec, 42
 Priesthood, the, 68
 Pucugh, 44

 Quetzal bird, 73
 Quetzalcoatl, 39
 Quiches, 44, 140
 Quirigua, 21

 Rainbow goddess, 40
 Rain signs, 91-94
 symbols, 72, 74, 75
 Rattlesnake, the, 75
 Rays, signs for, 98
 Rebus writing, 13
 Rhetorical use of numbers, 24
 Rubrication of codices, 79

 Sacred numbers, 25
 Sastanquiqui, ruins of, 106
 Saturn, planet, 106
 Scorpion symbol, 67, 75, 117
 Serpent eye, the, 84
 goddess, the, 63, 124
 gods, 38, 124, 128
 the feathered, 38, 56, 57
 wand, 103
 Shells, symbolism of, 19, 90
 Shield, the heavenly, 107
 star, the, 58
 Shields, designs on, 95
 Shooting stars, 35
 Smoke, sign for, 97
 Solstice, symbol of, 74
 Souls, fate of, 44
 "Spectacles" sign, 85
 Speech, sign for, 97, 98
 Spider-web goddess, 40
 Sun god, the, 39, 57, 123
 signs, 87

- Tableau des Bacabs, 48, 64
 Tancucula, 44
 Tapir, the, 54, 138
 Tel cuzaan, 42
 Terrestrial Paradise, 46
 Textile signs, 96
 Thirteen, as symbolic, 25
 Thunder, personified, 63
 Tikal, 29
 Time, symbols of, 76, 127, 128
 Tlaloc, 51, 55
 Tomahawk, the, 104
Tonalamatl, the, 27, 29, 31
 Tongue, piercing, 76
 Toniná, 139
 Tree of life, 48, 53, 59, 62, 101, 128
 "Trinal" emblem, 95, 136
 Turkey, the, 74, 90
 Turtle, the, 74, 119, 126
 Tzental dialect, 19, 35, 113
 Tzentials, 37, 38, 113

 Uac lom chaam, 43
 Underworld, the, 44
 Union, signs for, 100

 Venus, the planet, 33, 34, 106
 sign for, 88, 106
 Vigesimal system, 18
 Vultures, 73, 125

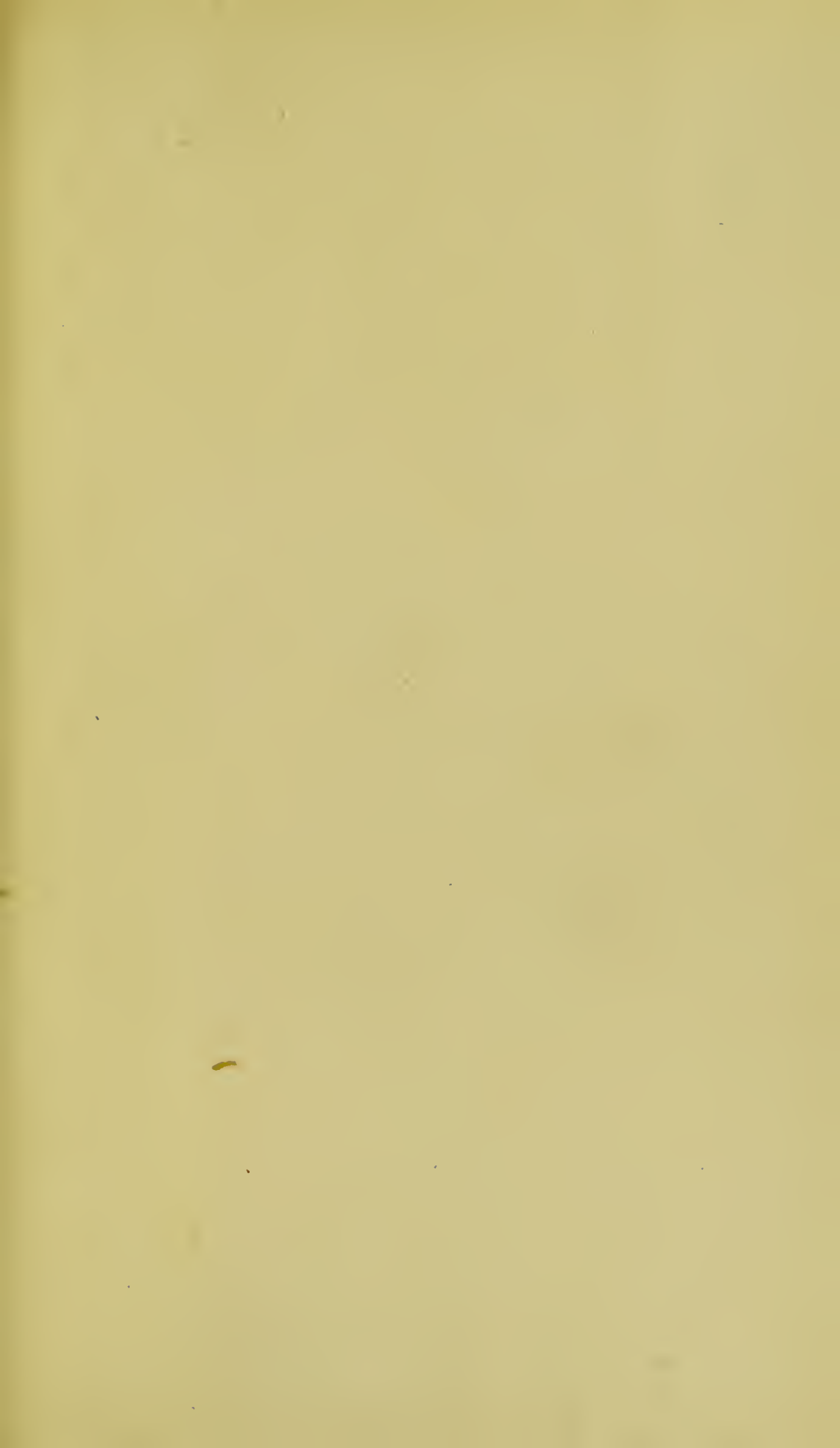
 War, gods of, 44, 65, 123
 Water deities, 40, 41
 Wind cross, the, 115, 116
 World-sign, the, 129
 Writing, direction of, 79

 Xabalba, 44
 Xaman ek, the North Star, 57
 Xibilba, 44
 Xipe, 66
Xiuhmolpilli, the, 31
 Xnuc, *see* Ix nuc
 Xmucane, 49, 50, 61, 63, 112, 125
 Xoc bitum, 42
 Xpiyacoc, 61
 Xux Ek, Venus, 60

 Yax coc ahmut, 38
 Yellow, sign for, 88
 Yucatan, 9, 37, 42, etc.
 Yum chac, 41
 cimil, 44
 kaax, 41

 Zac chamaybac, 44
 Zac zini, 41
 Zotzils, 12, 138
 Zuhuy dzip, 42
 Zuhuy kak, 42





Publications of the University of Pennsylvania.

Series of Philology, Literature, and Archæology.

Volume I.

1. Poetic and Verse Criticism of the Reign of Elizabeth.
By FELIX E. SCHELLING, Professor of English Literature. \$1.00.
2. A Fragment of the Babylonian "Dibbarra" Epic.
By MORRIS JASTROW, Jr., Professor of Arabic. 60 cents.
3. *a.* *Ilpós* with the Accusative. *b.* Note on a Passage in the Antigone.
By WILLIAM A. LAMBERTON, Professor of the Greek Language and Literature. 50 cents.
4. The Gambling Games of the Chinese in America: Fán t'án and Pák kòp piú.
By STEWART CULIN, Secretary of the Museum of Archæology and Paleontology. 40 cents.

Volume II.

1. Recent Archæological Explorations in the Valley of the Delaware River.
By CHARLES C. ABBOTT, Curator of the Museum of American Archæology. 75 cents.
2. The Terrace at Persepolis.
By MORTON W. EASTON, Professor of Comparative Philology. 25 cents.
3. On the Articular Infinitive in Demosthenes.
By WILLIAM A. LAMBERTON, Professor of the Greek Language and Literature.
4. The Life and Writings of George Gascoigne.
By FELIX E. SCHELLING, Professor of English Literature. \$1.00.

Volume III. [*In preparation.*]

1. Assyriaca.
By HERMAN V. HILPRECHT, Professor of Assyrian and Curator of Babylonian Antiquities [\$1.50.
2. A Primer of Mayan Hieroglyphics.
By DANIEL G. BRINTON, Professor of American Archæology and Linguistics.
3. The Rhymes of Gower's *Confessio Amantis*.
By MORTON W. EASTON, Professor of English and Comparative Philology.
4. Social Changes in the Sixteenth Century as Reflected in Contemporary Literature.
By EDWARD P. CHEYNEY, Assistant Professor of History.

This volume to be followed by:—

- a* A Re-examination of the Trenton Gravels.
By CHARLES C. ABBOTT, M.D.
- b* Paleolithic Man on the Delaware.
By HENRY C. MERCER, of the Museum of American Archæology.
- The Building Operations of Nebuchadnezzar II, King of Babylon.
By MORRIS JASTROW, Jr., Professor of Semitic Languages.
- Plutarch as a Philologist.
By ALFRED GUDEMAN, Associate Professor of Classical Philology.
- Two Plays of Miguel Sanchez, "El Divino."
By HUGO A. RENNERT, Professor of Romance Languages.

AGENTS FOR UNITED STATES, CANADA, AND ENGLAND,

GINN & COMPANY,

7-13 TREMONT PLACE, BOSTON, U.S.A.